

The Electragist

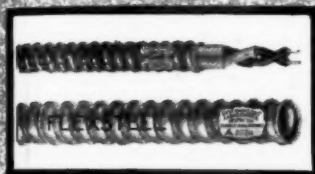
TRADE MARK REG. U.S. PAT. OFFICE

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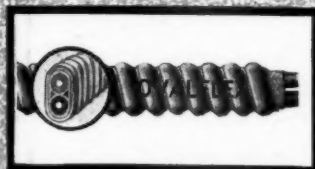
Association of Electragists
INTERNATIONAL

AUGUST, 1927

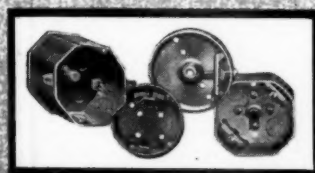
National Products are Quality Products



Armored Cable



Flat Armored Cable



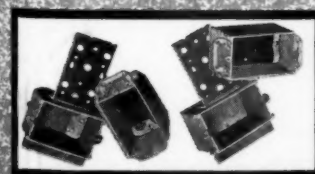
Economy Boxes



Non-Metallic Sheathed Cable



Outlet Boxes—Covers



Switch Boxes

THE least of your troubles is the cost of labor and material.

Do not upset your set labor cost by use of uncertain material.

National Electrical Products melt into the job without those labor losses usually incident to promiscuous buying.



Zinc Enamel Conduit



Black Enamel Conduit



Non-Metallic Conduit



Metal Molding



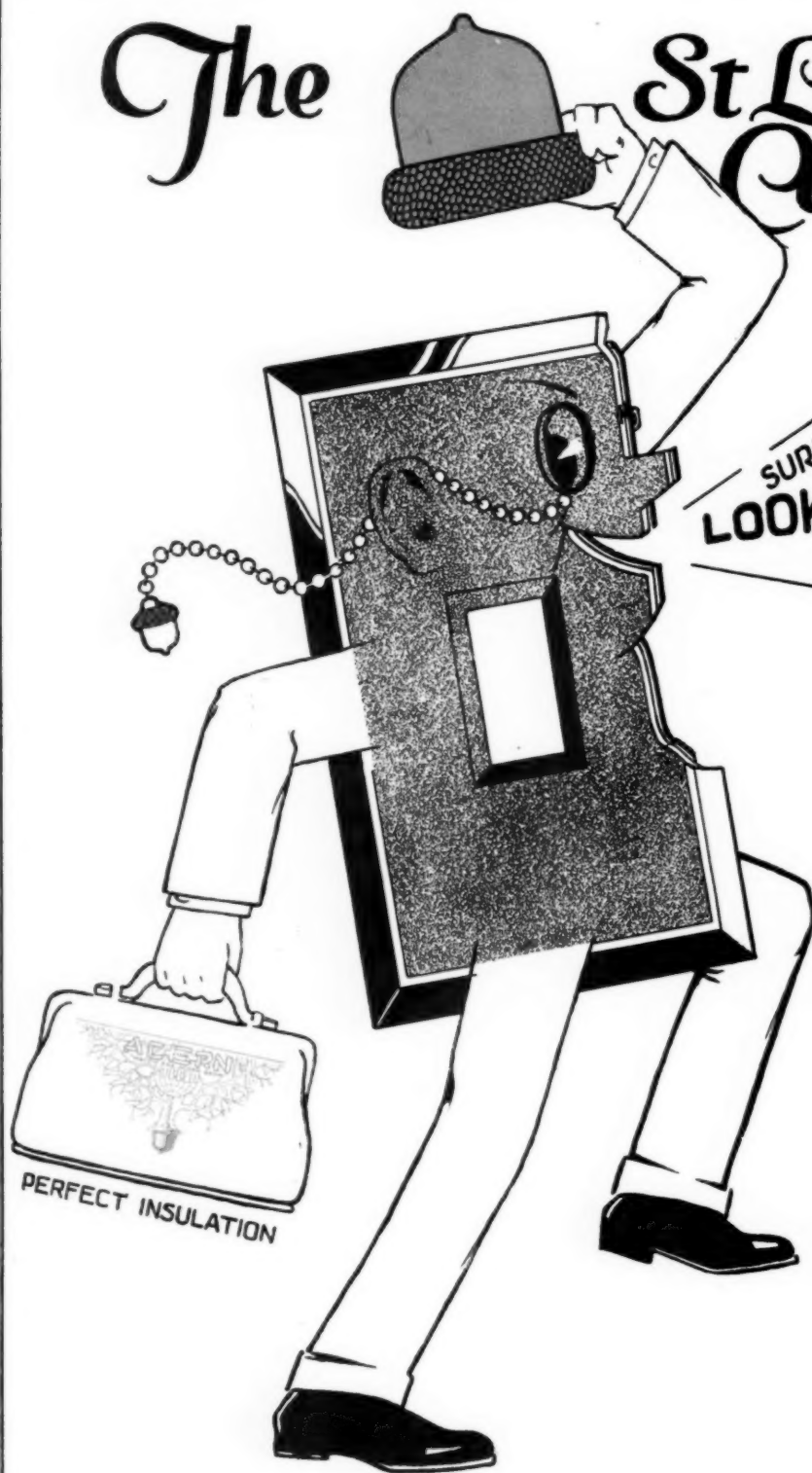
Racks, Brackets



Rubber Covered Wire

National Metal Molding Company
Electrical Products
PITTSBURGH PENNSYLVANIA

The St Louis Convention



SURE I'll BE THERE:—
LOOK FOR THE ACORN
BOOTH 56

—I'm bringing the family along, too; Mrs. Acorn Plate, the Acorn Plate kids and a lot of new Acorn friends I'm sure you've never seen before but will be tickled to death to meet.

—yes, the family picture has changed a lot since you saw us last. You know, lot of additions, new faces, new clothes,—pretty swell, too, if I do say it.

—we've taken quarters for the three days down at the Chase Hot'l. Booth 56, the main run-way, I guess they call it. Anyhow, you CAN'T miss us. We'll all be there. So drop in, look us over, meet the family and friends; we'll all have a good time together.

—oh yes, before it slips my mind, I think we'll have a little surprise for all of you.

—SO LONG!—see you at the Convention, August 9th to 12th, Booth 56. Don't forget!

HARVEY HUBBELL
INC.
HUBBELL
ELECTRICAL WIRING DEVICES
BRIDGEPORT CONN. U.S.A.

BRANCH OFFICES
ATLANTA, GEORGIA—138 Marietta St. H. C. Biglin.
BOSTON, MASS.—176 Federal St.
CHICAGO, ILLINOIS—318 W. Washington St.
DENVER, COLO.—1109 Broadway. The Sales Service Co.
NEW YORK CITY, N. Y.—30 E. 42nd St.
PHILADELPHIA, PA.—5th Ave. Philadelphia Bourse (Exhibition Dept.)
PITTSBURGH, PA.—State Theater Bldg.
SAN FRANCISCO, CAL.—390 Fourth St. Garrett Young & Co.

The Electragist

(The National Electrical Contractor and The Electrical Contractor-Dealer)

Official Journal of the
Association of Electragists—International

Vol. 26

AUGUST, 1927

No. 10

The Electrical Contracting Business Situation

By S. B. Williams, Editor, The Electragist

IN ANALYZING the present economic situation with respect to the electrical contracting business one is faced with conflicting opinion. In general business so far this year throughout the country has been good with prospects of improvement. New building contracts, according to the Department of Commerce, are in excess of any previous year. The weekly average for the first quarter of 1927 was \$91,230,000 against \$89,052,000 in 1926; the weekly average for the second quarter was \$121,183,000 against \$108,080,000 for the same period in 1926.

Unlike previous years, however, the conditions are not uniform; they are what is known as "spotty." In certain sections of the country new building has been very poor while in other places it has been humming. Moreover, while building as a whole is up there are certain types of building which have fallen off, most notably residential.

There is plenty of work for the big electrical contractor, but the field where the small contractor operates has been constricted this year.

The drop in residential construction has for the most part been confined to speculative ventures and from all appearances this class of building will continue to drop off. The only reason it has remained as active as it has is because of the ease with which money can be secured at reasonable terms. The moment there is a greater demand by industry for money for expansion or stock accumulation purposes this class

of building will lose its attractiveness to the investor.

The falling off in residential and other small construction work, and the knowledge that this situation is likely to be worse before it is better, has placed the electrical contracting industry in the position where it must "fish or cut bait."

It is not the great big contractor who has to worry because his business has always depended upon large new construction and that on the whole combines to go ahead. Outside of the large metropolitan cities, however, the contractors who have engaged solely in the large work are finding new competition from the ranks of those who formerly confined their efforts to residential work.

Ten years ago there were approximately 15,000 electrical contractors. Today there are more than 30,000.

Ten years ago the smaller contractors did not have to depend on new residential construction; there was always plenty of work in the wiring of unwired houses. Today the number of such places has dwindled almost to the vanishing point.

The Remedy

What are we to do? Shall we demobilize this army of over 30,000 electrical contractors by the economic route of "survival of the fittest," or shall we find a less demoralizing way out?

There is not the slightest doubt but

what the statement "There are too many electrical contractors" is absolutely right. But the fact remains that these men are in business and every one that is forced out of business costs many people a considerable amount of money.

If to demobilize this army of electrical contractors meant that only those forced out would lose it would not be so bad. Unfortunately, a man does not drop out of the picture until he has caused a half a dozen other contractors to lose money by competitive bidding.

That these poor contractors may cause the jobbers to take a loss need not worry the contractors so much because if it were not for the liberality of the jobbers' credit departments this unhealthy condition would never have reached its present proportions.

It is our contention that a more stringent credit and collection policy on the part of the jobbers will reduce contractor price cutting competition and not only make it possible for more contractors to make a reasonable profit but will encourage them to sell rather than buy jobs.

For years certain contractors in every locality have believed that the one way to keep down the number of irresponsible contractors was by means of drastic license ordinances. It is doubtful if such measures ever are fully effective or if they retain their effectiveness for a period of years. At any event, whatever the value of such ordinances, there is a growing distaste within the indus-

try for measures which are purely restrictive.

Jobber's Part

Since there are now too many contractors obviously there is no need for any more joining the ranks. The jobbers can control this situation through credits. In those cities where the jobbers have been educated to the benefits to be derived from better credit control there is less trouble.

The central stations can play their part by refusing to set up new contractors.

The inspection departments can help by insisting on strict compliance with the law where a contractor is a repeated offender to cause his license to be revoked.

These are all natural and orderly remedies. Never should any measure which is purely restrictive be employed. Every man has the right to work where and as he chooses provided he does not jeopardize public morals, health or safety.

On the other hand, there are some

who feel that the present situation is one which calls for a sweeping economic demobilization of contractors. The final result would most probably be beneficial—the cost would be prohibitive.

If there were no certain future, if all we had to depend upon was the uncertain new building market, then perhaps such economic surgery would be the only logical thing to do. There is another way out, however, but it calls for action.

Old House Wiring

There is not a house that has been built for ten years or more that does not present a market for wiring and fixtures. The electrical industry has known the facts for over two years and yet aside from a few local efforts little has been done.

The copper and brass people saw the possibilities in rewiring and they did not wait for the electrical industry, but have gone ahead and blazed a trail.

The general building industry has started a campaign of renovating old

homes—homes that are well constructed but which have lost their value when compared with modern designs. A major place in home renovation is allotted to wiring and lighting.

The inspection interests are doing more and more reinspection work and are bringing out an increasing number of rewiring jobs.

The lighting fixture manufacturers have voted a preliminary sum to help educate the trade.

This is the opportunity—rewiring and refixturing—which has endless possibilities. With such an opportunity for work there is no need for an economic demobilization of electrical contractors.

Except as rewiring and relighting propaganda spreads to the large building this is purely a field for the smaller contractor. Just at present he may not, as a class, be in a very comfortable position so far as work goes, but the future looks bright. There is more business in sight for this class of contractor than there ever was.

Appliance Maintenance Service Produces New Business

THE Crane Electric Company, Summit, N. J., has created a department to render service to appliances it has sold and which have passed the twelve months' guarantee period or to appliances which have been purchased elsewhere. A charge of \$8 per year is made for the service.

The new department was formed because it was thought that there was a definite field for such a service; that people would like to be able to forget the periodic oiling and greasing that should be attended to in connection with washing machines, for example, repairing of cords, etc., on all appliances, and that they would be willing to pay a reasonable charge for the service.

For the \$8 charge, plus the cost of any repairs necessitating materials and extra time, the owner of an appliance can forget all about the servicing problem. About 15 minutes time is allowed per visit in each home for the annual charge, and minor repairs on cords and the like are done without any extra cost.

The service man goes to each home on the company's "trouble truck," which is equipped with tools and materials of such a varied nature that almost any work encountered can be attended to without the necessity of returning to the shop. In addition, the truck carries a supply of fuses, lamps, sockets, silk cord, wire, etc., and many times a sale has been made on the spot which might not otherwise have come to the company. The service man has the authority to install extra outlets or other work if so ordered and has the materials to do it. This is done on a time and material basis only.

Up to the present no contract form of any kind has been prepared, the customer merely agreeing to the service verbally. When it is sold to him a card is made out and a man is sent to inspect the appliances in the home. A notation is then made on the card, which is 3 in. by 5 in. in size, of the next time such attention is due, usually three months later. These cards are filed by the girl in the office and she

makes out a service slip several days in advance of the day a call is due in order that the service man can route his work to include such a stop.

The charge of \$8 was decided upon after it had been estimated that four calls a year are generally necessary to keep an appliance functioning properly. Ordinarily a service charge of \$2.25 is made for such individual calls, which would bring the total cost of such a service on that basis up to \$9 a year. It was estimated that the volume of business would offset the difference of the dollar and that the service would bring prospective customers into the store.

The new service has been in effect but a short time and already quite a number of residents of Summit have contracted for it. It has about passed the experimental stage now, however, and Mr. Crane considers it a splendid builder of good will as well as being an actual producer of business for the company. A profit of \$2 per customer has been figured for the service itself.

A. E. I. Convention to Consider Motor Sales Policies

Twenty-seventh Annual Gathering This Month at St. Louis is Expected to Surpass All Others in Importance

ONE of the features of the twenty-seventh annual convention of the Association of Electragists, International, at St. Louis, August 9 to 12, will be the proposed formation of a motor section as a part of the organization. The main purpose of such an addition will be to clarify the commercial situation with regard to motor selling, but other angles will also be taken into consideration.

C. J. Geisbush, manager of the California Electragists, will present the proposition before the convention at the last session of the meeting, which will be on Friday, August 12. The California Electragists have such a section on the Pacific Coast and have been seeking the cooperation of motor manufacturers in enlarging their scope. This has been given in many instances, and Mr. Geisbush will present his plans before the convention. Special requests to be presented at the convention have been sent to a number of the leading motor men who are members of the international and it is expected that they will lend impetus to the new movement.

All the booths in the manufacturers' exhibit, which is to open on Tuesday, August 9, the first day of the convention, and which is to be held in the Hotel Chase also, have been sold, and representation from the largest manufacturers of electrical apparatus and supplies is assured.

Round-Table Discussion

The conference of state and local representatives which is to be held at 2:30 p. m. on the afternoon of the same day will include a round-table discussion of the problems affecting the state and local secretaries, executive managers and association officers. Some of the most prominent men in electrical association work will be present at this session to talk over with others engaged in similar pursuits their problems and other matters pertaining to their work.

Leaders of the four commercial



Clyde L. Chamblin
President, Association of Electragists, International

branches of the industry will address the opening session of the convention proper on Wednesday, August 10, at 10 a. m. The general subject will be "A United Industry." These men will represent the manufacturers, central stations, jobbers and contractors. D. Hayes Murphy, president of The Wiremold Company, Hartford, Conn., and vice president of the supply division of the National Electrical Manufacturers' Association, has chosen as his topic "The Manufacturer's Viewpoint," George Cullinan, Graybar Electric Company, chairman, executive committee, Electrical Supply Jobbers' Association, who will represent the jobbing branch, will speak on "Some of Our Problems as We See Them," H. T. Sands, vice president of the Electric Bond and Share Company and newly elected president of the National Electric Light Association, will talk for the central station industry, "The Need of the Hour" being the subject, and Clyde L. Chamblin, president of the Association of Electragists, International, will take as his subject "Industry Interdependence."

The general subject of the afternoon

session on the same day will be "The Association at Work." Addresses at this meeting will be made by E. N. Peak, president of the Iowa Association of Electragists; C. J. Geisbush, secretary of the California Electragists; John Kuhlemeyer, secretary of the Illinois Chapter of Association of Electragists; N. J. Biddle, manager of the Detroit branch, and A. P. Peterson, manager of the Maryland Division. "The Purpose of Organization" will be the subject of Mr. Kuhlemeyer's address, in which he will bring out the necessity of getting together with a better understanding and a more correct attitude toward the local and international associations. Mr. Biddle's talk, "Policies and Their Application," will cover the methods used by his association in arriving at what to do and how to do it. Mr. Peterson will follow the general subject in his talk, "The Association at Work."

The general subject of Thursday's session will be "Selling Our Service," and this meeting will be addressed by W. W. Freeman, president of the Society for Electrical Development; Earl Whitehorne, commercial editor of *Electrical World* and chairman of the industry conference on wiring, will speak on "The Wiring Conference and the Next Big Job," and H. H. Courtright, Valley Electrical Supply Company, Fresno, Cal., his subject being "The Through - the - Dealer Merchandising Plan."

Open Forum

On Wednesday afternoon the open shop and union shop sections will meet, and two hours on Thursday will be devoted to an open forum which will discuss questions of timely interest, such as registration and licensing legislation.

The days of the Municipal Opera and Style Show have been changed. The former will be held on Wednesday instead of Tuesday, and the Style Show is scheduled for Tuesday.

N. E. L. A. Offers Better-Merchandising Suggestions

DURING the past year the General Merchandising Committee of the National Electric Light Association has brought together representatives of the several electrical and non-electrical groups merchandising electrical appliances to try to find a way to eliminate the trade dissatisfaction with Central Station merchandising policies. The various suggestions and plans were virtually summarized by the Retail Hardware Dealers' Association and these in turn gave rise to a set of standards of practice to be

followed by power companies being suggested by the N. E. L. A. General Merchandising Committee.

Whether the N. E. L. A. unofficially adopts these standards they are of interest as being the first statement of policy by a committee of the association. There is no doubt but that these suggestions if followed will be more productive of better trade relations and will offer more opportunity for profit by the contractor-dealer.

These standards are as follows:

SUGGESTED STANDARDS OF PRACTICE FOR MERCHANDISING BY PUBLIC SERVICE CORPORATIONS BY

THE GENERAL MERCHANDISING COMMITTEE

1. *The primary functions of the Central Station Merchandising Department is to increase earnings through load building, but it is likewise essential that profit be obtained through merchandising operation on cost principles.*

It must be recognized that the Central Station bears development expenses which are especially not shared by the non-electric dealer who sells primarily the electric articles having public acceptance. Pioneering is expensive and rapidly absorbs profits from the best sellers. It is usually the promotion expenses through which all the trade benefits that makes the difference between profit and loss on the Central Station merchandising statement.

We bring to the attention of our friends in the hardware association, and others interested, that there is a normal cost for securing all business of the power companies, and the cost per kilowatt added to the lines from the merchandising branch is always low as compared to the cost of building the light and power load which is generally recognized as an obvious and legitimate expense.

2. *List prices should be maintained, when established and published as the standard selling price by the manufacturer.*

When national activity and volume selling is contemplated and the net price to be paid by the public is to be lowered by manufacturer consent, through premiums or allowances, we recommend:

(A) If the selling plan originates with the manufacturer the manufacturer make adjustment of discount to the dealer during the period of the sale to make possible similar action by the dealer.

(B) If the plan originates with the Central Station merchant it is suggested that the local dealers be invited to tie in during the period of the sale on advantageous terms.

3. *The giving of premiums as an occasional stimulus to business is a long established custom and its value is measured by results obtained locally through this practice in merchandising.*

It is of primary importance that when premiums are used the customary value of the

article as designated by the manufacturer should be used in advertising. Misleading advertising is obviously not to be recognized by the Central Station company. We believe the best interests of the company will be served when sales with premiums are on a cooperative basis with the local trade.

4. *Deferred payments are now established practice and receive the support of leading financial men. The abuse of practice is evident in our industry and we suggest a return to sound economic terms.*

The "dollar down and a dollar a month" practice is uneconomical perhaps, but it had its origin in the Central Station effort to sell high grade appliances at higher prices against department store and drug store products and prices.

We must bear in mind that a mass of our electric consumers have low earning power and limited budget to invest in appliances and unusual terms are sometimes justified. However, extraordinary inducement in terms should not be offered except—

(A) Where no other dealers are in the local field to be affected and—

(B) Where local dealers are effectively tied-in to the selling campaign where the unusual terms are used, and the Central Station carries the account.

We suggest twelve to fifteen months limit for financing with exception of appliances in the stage of market development. We believe with the exception previously noted the point of the hardware association is well taken in the suggestion of \$15 as the minimum price for offering installments, and a ninety-day limit on such payments.

Initial payments on merchandise, with few exceptions, should be a minimum of 10 percent. Substantial initial payments should be encouraged.

In all cases a carrying charge should be made for financing, commensurate with the cost of rendering the service.

5. *Non-electric merchandise should be sold with careful limitations.*

The lines of electric merchandise are limited, and this adversely affects the attendance at the electric shop. The addition of kindred lines is justified to a degree, especially when sold in conjunction with electrical appliances. The practice of selling other than electric lines should be adopted only after effort is made to broaden the electric lines carried, to the fullest extent. The electric department store is an advantage to the Central Station over the novelty shop.

6. *Whatever is in the public interest in our Central Station merchandising practice should prevail.*

We suggest that the electric and non-electric trade get together locally for common understanding, and active cooperation for merchandising in the public interest. Where leagues are established the non-electric trade can be invited to join, or direct contact be made with other merchants selling electric devices. We have solicited our customers to join with us in ownership of the company. Why not solicit our commercial customers to aid us in the marketing of Electric Service?

Current for 2-Phase Motor

A reader has asked the question: In figuring the current per phase on 2-phase, 4-wire distribution, is it correct to consider, for instance, on the basis of a 10-h. p. motor, that the amperage would be the same as a 5-h. p. motor at 2-wire, single phase?

The answer given was that the amperes per phase for a 2-phase 220-volt motor rated at 10-h. p. would be exactly the same as the amperes per phase for a single-phase, 220-volt, 5-h. p. motor, if both the motors had the same efficiency and power factor.

Taking the actual catalog data of two motors of the same make, voltage and speed, the amperes per phase for a single-phase repulsion start induction motor of 5-h. p. at 1,800 r. p. m., 220 volts is given as 25.4. For a two-phase, 10-h. p., squirrel cage induction motor at the same speed and voltage, the amperes per phase is 21.5. In this particular case, therefore, the single-phase motor takes about 15 percent more current per phase than the 2-phase motor of twice its size. The 5-h. p. motor has a slightly lower efficiency and power factor, part of which is due to the smaller size and partly on account of the fact that it is a different type of motor.

Pulling in a Long Feeder in a 31-Story Hotel

Such an Installation in a Tall Building Presents Different Problems Than Those Encountered in Long Horizontal Runs

AN OBSERVATION was made of the pulling in of a long vertical feeder in the Savoy Plaza Hotel in New York, a 31-story building. The feeder was installed from the 27th floor to the sub-basement, a vertical distance of about 317 ft. On the 21st floor the riser shaft was offset, making it necessary to use three elbows in the conduit. On the second floor there was another horizontal run with four more elbows and one $4\frac{1}{2}$ in. offset. In the basement there was a third horizontal run with four elbows and an 8 in. offset. The feeder had its origin at the switchboard and terminated in a lighting distribution panel on the 27th floor, feeding

to bushing was 502 ft., with 11 elbows and two offsets. This was divided into a vertical drop of 55 ft. from the 27th to the 21st floor, and horizontal run of 40 ft. on that floor with three elbows; a second vertical drop of 250 ft. from the 21st to the 2nd floor, a second horizontal run of 93 ft. with four elbows on the second floor; a third drop of 26 ft. to the basement with a horizontal run of 87 ft. and four elbows, and a final drop of 11 ft. to the sub-basement.

Preparations

The preparations consisted of neatly coiling 600 ft. of rope from a pile left at the winch by a preceding operation. This coil was then carried to the hoist for delivery on the 27th floor and on arriving at the top of the run was dropped and pulled through it. The winch and snatch-block had at the time of observation already been mounted. It was kept at this place because all the feeders terminated in a bank of 40 conduits, as can be seen in Fig. 3. Other preparations consisted of fishing the horizontal runs on the 21st, 2nd and basement floors, of inspecting the power drive used for driving the winch, of mounting the reels of cable and of setting up the cable check.

The Cable Check

As can be readily understood the main problem in a long vertical run is to check the descent of the cable by gravity. Take, for instance, the 225 ft. drop from the 21st to the 2nd floor containing three 350,000 CM cables weighing 520 lb. and all the vertical sections of cable weigh a total of 1,300 lb. The cable check is shown in Fig. 1. It consists of two 2 in. by 8 in. planks with a tie member at the top, leaning against the wall at an angle of about 60 deg. Two $1\frac{1}{2}$ -in. pipes, one near the top and one about 3 ft. from the floor, rest against blocks of wood and are retained in place, loosely, by flat steel straps. The picture was taken just before the

nose of the cable was started in the run. The set of cables is taken around one leg of the check which is covered with a few layers of burlap to protect it against damage. At this point is pro-

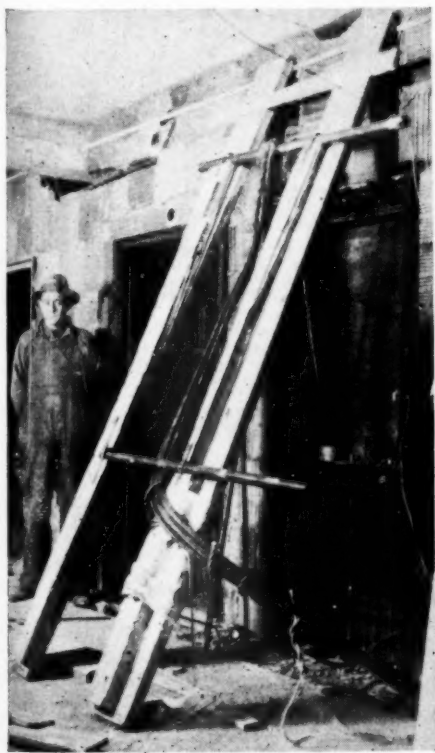


Fig. 1—Cable Check

also two panels directly below on the 26th and 25th floor and passing through cable support boxes on the 18th, 14th, 10th, 6th and 2nd floors, and was installed in one continuous operation.

The length of the run from bushing



Fig. 2—The Winch and its Rigging

vided one of the safety devices to prevent the cable running away. It consists of looping a rope around the cables on each side of the burlaped leg in such a manner that when its loose end is pulled the cables will be jammed against the leg and around it. The illustration shows the loops of the rope fairly tight around the cables, but ordinarily while the cables are being fed in they are very loose and slide along the cables without impeding them. The end of the checking rope lies on the floor in readiness for one of the attendants to pull should the cables threaten to accelerate beyond control. The cables pass under the lower pipe and over the upper pipe. One man handles the loop of cables over the upper pipe and feeds it into the conduit run, another man the loop under the lower

pipe and a third man pulls the cables off the reels.

Pulling In

Although during a considerable part of the time the tendency of the cables is to descend by gravity, they are held in check enough to cause the pulling rope to remain tight. This is done because the slack rope would pile up in one of the boxes leaving the nose of the cables unguided in the box, thereby making it unlikely that the nose would find its way into the continuation of the conduit. Additional precaution against

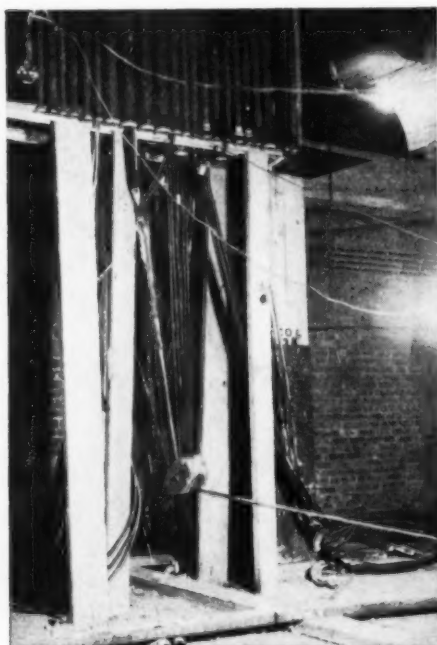


Fig. 3—End of Conduit Run in Sub-basement

the pulling rope piling up in a box is taken by the men at the winch. Should the winch not keep up the rope is kept tight by hand. Wooden guides are also provided in the boxes, and as a final assurance to keep the cables moving steadily a man precedes the nose down and guides it if necessary.

During the installation of the cables under observation it was found unnecessary to use the checking rope, the friction on either the upper or lower pipe of the cable check being sufficient. This was on account of the horizontal run with its three elbows, six floors below the top.

The Winch

The winch is shown in Fig. 2 and the snatch-block for changing direction of pull is shown under the end of the conduit run in Fig. 3. The nose of the cable is just emerging from the conduit.

The winch is of the single reduction type and is driven by a power drive giving the drum about 10 r. p. m. and the rope a speed of 18 ft. per minute. The thrust member holding the winch in place horizontally consists of a plank butting against the wall and can be seen in Figs. 2 and 3 under the rope and on the floor. The member that prevents the winch from rising is the vertical plank appearing in back of the winch in Fig. 2. This plank serves also as a check to keep the rope tight when the drive is shut down. By keeping the rope tight it becomes unnecessary to take up slack each time the drive is started.

The rope is passed around the drum four or five times, the slack end being controlled by one man. As long as this slack is kept tight the winch will pull; when it is slackened the turns of the rope on the drum will fail to grip. Therefore the stress on the rope is always under control.

Two men operate the winch; one as just mentioned controls the stress on

the rope and the other operates the drive. The latter is in constant telephone communication with the man feeding in the cable at the top.

Co-operation between the widely separated parts of the pulling-in crew is essential. In this case the men at the winch were 29 floors below the men feeding in the cable at the top. A signal system is therefore necessary. A telephone was used, consisting of two hand sets, a two-cell dry battery, besides the wire. A single-wire is strung in all riser shafts during an early part of the job. The handpieces and battery are connected in series, the conduit in the shafts forming the return line.

The pulling-in crew consists of six men. Three at the top, one guiding the nose on its way down, through the various boxes, and two who are stationed at the winch.

The electrical work in this 31-story hotel is being installed by the Walter H. Taverner Corporation of 175 Fifth Avenue, New York, N. Y.

Keeping Cost Records on Radio Service Calls

BEFORE putting in its new method of handling radio service work, the Tollner Electric Company, Brooklyn, N. Y., found it was losing money in this department because material was not being properly billed out. To stop this loss a form, here shown, was drawn up and printed. It is in duplicate, one yellow and one white. The white, or original, is made out every time a radio service call is received and remains in the office. The yellow, or carbon, is given to the service man and is his instruction for doing the work.

When the work is completed he enters on his yellow form, in front of the customer, the amount of material, itemized, amount of labor required and amount to be charged to the customer. Before leaving the premises he must secure the customer's signature at the bottom of the form, showing that everything has been done to the customer's satisfaction.

On most of the calls the service man collects when the work is done, but where the customer has a charge account with the company the bookkeeper uses the service man's yellow slip for billing.

TOLLNER ELECTRIC COMPANY, INC.			
NAME	DATE		
ADDRESS	PHONE		
MESSAGE			
TERMS	JOB No.	R	512
	BILL No.		
MATERIAL			
MODEL	SERIAL NUMBER	RADIO SET	
TUBES			
TUBES			
TUBES			
"A" BATTERIES			
"B" "			
"C" "			
"D" "			
"E" "			
"F" "			
"G" "			
"H" "			
"I" "			
"J" "			
"K" "			
"L" "			
"M" "			
"N" "			
"O" "			
"P" "			
"Q" "			
"R" "			
"S" "			
"T" "			
"U" "			
"V" "			
"W" "			
"X" "			
"Y" "			
"Z" "			
SPEAKER			
MISCELLANEOUS			
ANTENNA WIRE			
INSULATORS			
LEAD IN			
LIGHTNING ARRESTER			
No. 10 R.C. WIRE			
No. 12 R.C. "			
GROUND CLAMP			
LABOR		HRS.	
TOTAL			
REPORT			
DATE		SIGNED	

The white forms are used as follow-ups on the service man. If he does not turn in a yellow sheet for every white in the company's file within twenty-four hours after receiving the order, the bookkeeper checks up on him.

Regulation of Appliance Loads on Branch Circuits

By L. W. GOING

Chief Electrical Inspector, Department of Public Works, Portland, Ore.

THE regulation of appliance loads on lighting and appliance circuits is an inspection problem which to date has successfully resisted every attempted solution, and is yet a problem which vitally affects the installer, the user and the inspector of electrical equipment. The present Code rule limiting branch fuses to 15 amp. cannot be safely exceeded without a radical departure in branch circuit wiring methods. However, reinspection of existing installations indicates a constantly increasing tendency to fuse branch circuits above 15 amp.

Field experience has shown that this overfusing results from: (1) Fixed circuit loads in excess of 15 amp.; (2) use of portable appliances which either singly or together with the fixed circuit load require current in excess of 15 amp. Cause (2) can be subdivided into (a) grouping and simultaneous use on a lighting and appliance circuit of portable appliances having individual ratings of 6 amp. or less; (b) connection either singly or in groups on a lighting and appliance circuit of portable appliances having individual ratings in excess of 6 amp.; (c) connection on lighting and appliance circuits of motor driven appliances which require current in excess of their normal rating because of starting or stalling.

Code Treatment

Cause (1) relating to overloading by fixed loads, can be remedied by suitable National Electrical Code treatment, either of the type specifying minimum wattage for given areas with due regard to the occupancy and use of such areas coupled with a definite wattage limit for branch circuits; or possibly by rules which prescribe directly the number of circuits necessary to cover a given area. Good reasons may be advanced for both types of treatment. For circuits intended for appliances as well as lighting, however, and most circuits are so used, it is better to specify a definite wattage limit for the fixed circuit load so as to

provide a margin of capacity for the attachment of socket appliances as permitted by present Code rules.

Sufficient Margin of Capacity

Referring next to Cause 2 (a), overloading by connection of portable appliances having individual ratings less than 6 amp. Such connection is entirely in accordance with Code rules yet it presupposes a sufficient margin of capacity between the fixed circuit load and the capacity of the circuit fuses to care for the current taken by the portable appliances. This is in direct contradiction to the Code rule permitting fixed circuit loads up to 15 amp., unless we can safely and reasonably assume that the fixed circuit load will not be all in use at one and the same time. Present Code treatment for circuiting and feeder layout, or rather the absence of such treatment makes such an assumption unsafe and invites overloading and overfusing of lighting and appliance circuits.

Suitable Code treatment to remedy Cause 2 (a) should therefore specify maximum wattage for fixed circuit loads so as to provide a safe margin of capacity for the inevitable connection of portable appliances.

Referring next to Cause 2 (b), overloading through connection of portable appliances exceeding 6 amp., individual rating, and while admitting that such connection is contrary to present Code rules, as long as manufacturers of appliances continue to equip high capacity devices with extension cords and plugs suitable and convenient for attachment to sockets and receptacles on ordinary lighting or appliance circuits, and as long as the general public is advised that such appliances are suitable for connection on such circuits, and in many cases even supplied with larger fuses by the seller of the appliance, just so long will Code rules prove of little avail in the elimination of overloading and overfusing from this cause.

One of the first considerations under which appliances are judged by Underwriters' Laboratories is "Suitability for installation and use in conformity with the requirements of the Code." While it is true that an appliance of greater capacity than 6 amp. equipped with ordinary attachment plug can be used in conformity with the requirements of the Code, it is also true that such appliances are more often than not attached to sockets and receptacles on lighting and appliance circuits.

Special Circuits

Individual or special circuits for appliances impose an added burden of expense and present an economic problem which cannot be ignored. Possibly the Code should recognize the existence of a diversity in the use of a fixed circuit load on residential circuits, and this diversity coupled with a liberal margin of capacity between the fixed circuit load and the branch fuse capacity might permit the use on lighting and appliance circuits of domestic appliances of more than 6 amp. individual rating. Just as a suggestion, 10 amp. might prove a very satisfactory limit for fixed circuit loads and still provide a liberal reserve capacity for the attachment of portables, particularly so in domestic installations where the fixed circuit load is seldom if ever all in use at one time.

Referring to Case 3 (c), overfusing because of excessive starting and stalling currents taken by certain motor appliances, experience has shown that this is a prolific cause of overfusing of branch circuits where the motor rating exceeds 3 amp., or, roughly, 1/8 h.p., at the usual branch circuit potentials.

As in cases (a) and (b) the safe operation of motor driven appliances on branch lighting and appliance circuits presupposes a margin of capacity between fixed circuit load and the branch fuse capacity, a supposition not assured by present Code rules. Where motors exceed 3 amp. rating their starting and

stalling currents present a serious obstacle to safe, trouble-free operation on 15-amp. lighting and appliance circuits.

It might be well to note here that while Rule 811 (a) prohibits the use on lighting circuits of heating appliances, either fixed or portable, rated in excess of 6 amp., Rule 809 (b), Item (2) fails to provide a similar limit in the case of motors, either fixed or portable. This omission, coupled with lack of exact data pertaining to motor starting currents, has resulted in much doubt

and confusion in the minds of inspectors as to the maximum permissible size of motors which may be properly used on lighting and appliance circuits.

Special Circuits

Proper recognition of the need of special circuits should be given by the Code and suitable Code treatment should provide for branch circuit equipment which will permit a more unrestricted use of the larger appliances, particularly heating appliances. Present

Code Rules 811 (a) and 1602 (d) defeat their very purpose by limiting the branch fuses to 15 amp. Furthermore, they do not permit of increasing the permissible wattage of appliances where 220-volt circuits are used. To be of practical use, special circuits should have circuit conductors larger than No. 14 and should be equipped only with polarity receptacles of a type with which the ordinary attachment plug used on lighting and appliance circuits cannot be used.

When Dreams Come True

By C. P. ANDREW

Treasurer, North State Electric Supply Company, Raleigh, N. C.

OUR home! With what pride we say it. It is a dream come true. a realization after years of hard work and the saving of many pennies.

As we sat around the fire during the long winter evenings, mother and father would spend hours drawing little sketches and studying plans. There must be a room for each of us children and a guest room. Mother said, "Don't forget the big roomy closets and breakfast nook." Father must have his smoking den. Hardwood floors, storm gutters, screens, tiled bath—these and countless other details came up for careful discussion. Mother's eyes shone with joy and anticipation as she went light-heartedly about the house. Father was as happy as a boy. The little home must be perfect. It must in reality be a dream come true.

She Trusts Us

And so, one of the most beautiful romances of life is started. Who shall be so base as to detract one bit of joy from its accomplishment?

Shall the electrical industry bring a shade of disappointment into mother's eyes? It is in our power to add to her joy, her pleasure, her comfort and her convenience. She trusts us. Shall we be worthy of that trust?

We know what should go into the electric wiring of the little dream home to make it a constant joy. It lies largely with us whether mother's dream comes true.

The architect has a limit of \$7,000. The building contractor takes it at that figure. He allows the large sum of \$70

of his bid to be spent by the owner for lighting fixtures. He tells the electrical contractor to put a ceiling outlet in each room, one light on the front porch and a convenience outlet in the living room. Perhaps the job comes to \$50.

Shame on the architect, shame on the building contractor and more shame on the electrical contractor to perpetrate such a downright injustice! The dream of years is shattered. The hopes and yearnings of the little home builder are ground ruthlessly under foot. The savings of a lifetime have gone into the first payment on the little home. The money is all spent. The electrical work is in—it cannot be changed. The fixtures are bought, and what a disappointment. They do not harmonize, they are a monstrosity of gilt and their very cheapness is a constant reminder that shrieks guilt! guilt! guilt!

Shall we continue to be a party to such a procedure? We in the electrical industry should first get our own hearts in the right place. Let's make up our minds to give the public adequate wiring and fixtures that harmonize.

Our Part

We can do this by working closer with the architects and the building contractors. We can prepare model wiring plans for various size homes. We can show how adequate installations will make for better satisfied clients.

After all, what difference does it make if the cost of wiring is increased \$50 or \$100 and the allowance for fixtures raised from 1 percent to 3 percent of the cost of the house. Practi-

cally all homes are financed over a period of 13 years. This figures out to be a payment of only 12½ cents a week for every \$100, and if the cost of the electrical installation is increased \$300 it means only 37½ cents more a week for the owner to pay. Show this figure to architects, building contractors and prospective home owners and the chances are they will request you to put in the best you have.

Let us all join our local electrical league, affiliate with the Electragist association and give our support to a nation-wide campaign to educate the public and to work with the architects and building contractors so that we may truly "make dreams come true."

Contractor Advertising on a Blotter

Austin & Moore, Long Island City, N. Y., have been featuring their installations on a series of blotters which



have been sent out every month. Space has been left in the plate for the insertion of a change of type for each issue, and each month a different job done by the company is featured. This ties in with the company's other advertising.

Raising the Standard of Wiring in Old and New Homes

Electrical League of Cleveland's Co-operation
Productive of Excellent Results. Pittsburgh and
Toledo Plan to Stress Rewiring

ELECTRICAL leagues in various parts of the country are alive to the possibilities afforded for re-wiring and re-fixturing work in old homes, and already three have taken the lead in including this class of work in their efforts to bring the electrification of new homes up to a standard. The Electrical League of Cleveland has worked out a plan of cooperation with speculative builders, a feature of which is the league's endorsement on homes that have come up to its standard in wiring and lighting and its aid in selling them; seventeen contractor members have included the rewiring of old homes as an important part of the plan; the Electric League of Pittsburgh is making a concerted attempt to improve the wiring in old homes, and the Electrical League of Toledo is now working on a comprehensive plan to stimulate rewiring and re-fixturing in the homes in its territory.

The Cleveland plan of cooperation contains many unique features. In the first place the league has prepared a set of wiring and lighting specifications as a minimum standard and has encouraged the builders of speculative homes in the city to bring the wiring in the homes they build up to the league's specifications. If this is done the league will bend every effort to dispose of the dwellings for the builders. The specifications in the main are similar to those for Red Seal homes.

The plan has been in operation but a few months and already there are twenty-nine speculative builders who have agreed to wire and light up to the league's specifications every house they build. Among them these men have between one and two hundred dwellings under construction. At the present time this number of builders is about all the league can handle on the co-operative basis, and no more will be added until proper machinery can be set up to handle the increase and some

sort of permanent regulations can be adopted.

At a series of three dinners given at the league by the residence-wiring contractors to the builders the idea was launched. The electrical men explained the advantages of adequate wiring and lighting and its sales value, and twenty-nine of the builders agreed to cooperate.

What the League Does

The electrical league agreed as its part of the plan to use advertising space in the Sunday newspapers of Cleveland

of such illumination not to exceed \$40 in any one case. The exterior lighting is done by a battery of floodlights and brings out the house in bold relief and emblazons the league sign attesting to the completeness of the wiring and lighting in the dwelling.

In addition to this the league furnishes for each home completed 500 descriptive handbills for distribution. These contain a description of the house, together with the main features of its construction. A cloth sign 18 in. by 30 in. for attaching to the house is



Wired and lighted as specified by the Electrical League means step saving, time saving and money saving switches - an average of at least three places in each room to connect portable lamps and appliances.
Artistic lighting plus comfort and utility.


DESCRIPTION OF HOUSE:
Location—1910 Harrison Blvd. at the entrance beach close to schools and stores—Lot 40x105.
Architecture—Dutch Colonial with stone and brick entrance. Sided with hanging siding.
Veranda—Tilt floor.
Reception Hall—With great chest. Finished in walnut—walls beautifully decorated with colored paper.
Living Room—Finished same as reception hall and is well lighted with large bay window facing the south, ample wall space for pictures, also large Colonial fireplace.
Dining Room—Is finished in old ivory with antique glazing—walls are hand painted.
Sun Room—Adjoining dining room and separated by French doors, old ivory finish with antique glazing—walls decorated with imported wall covering.
Breakfast Room—Between dining room and kitchen with built in table and seats with large china cabinet.
Kitchen—Well lighted and airy—conveniently arranged with cupboard and clothes closet. Refrigerator room at entrance with cupboard and broom closet.
Baths—Two to living room with separate entrance to kitchen.
Upper Hall—Finished in ivory and walnut with large linen closet.
Bedrooms—Three large rooms finished in ivory—beautifully decorated, clothes closet in each.
Bath—Tilt floor and walls—bath in tub with shower—pedestal lavatory—clothes closet and built in electric wall heater.
Bed Room—Large floor space—plastered walls.
Pail Room—Separate the walls for food and coal room, each with a large combination heater. Separate connection for electric stove and washer.
Heating—Hot water with over sand boiler—ample radiators in each room.
Garage—2 car—concrete floor and drive.

For Sale by **JULIUS LINDER, Contractor and Builder**
15615 DELAWARE AVENUE **LAKEWOOD 6511**

Handbill (above) Furnished by League for Each Certified Home

to advertise the location of the houses wired under the specifications. An illustration of the first house completed by each builder is carried in the advertising copy. For a period of thirty days the league offered to furnish current for the illumination of one house for each building contractor, the cost

Bulletin Prepared by One Contractor to Stimulate Rewiring (below)



FREE SERVICE

Wired and lighted as specified by the Electrical League means step saving, time saving and money saving switches - an average of at least three places in each room to connect portable lamps and appliances.
Artistic lighting plus comfort and utility.

**MOST HOMES
Need More Wiring and Better Lighting**

Without obligation on the part of the owner of an occupied house, we will look over the wiring and lighting equipment and furnish an estimate on the cost of improvements that might be made to make the home more comfortable, more convenient and more attractive.

Occupied homes as well as new homes may be wired and lighted as recommended by The Electrical League.

Telephone—Bulwerd 1120

THE LAKEWOOD ELECTRIC CO.
1110 DETROIT AVENUE CLEVELAND, OHIO

also furnished to indicate that the wiring and lighting are in accordance with the league's specifications, and in addition a poster for the panelboard is given.

One of the most interesting features of the Cleveland plan is its adaptability to houses of all classes, even those selling at extremely low figures. One of

the lower priced homes built to sell at \$6,500 was disposed of in less than two weeks after it was offered for sale under the sponsorship of the league.

Money Value

In actual dollars and cents value to the electrical contractors the plan has been especially noteworthy. In one \$9,000 house the wiring cost was increased, due to its being brought up to the league's standard, from \$80 to \$210.30. The allowance for lighting fixtures under the old method would have been something like \$55, but the fixtures installed cost the builder \$112.50, or just about double. J. E.



LIGHTING THE HOME

as recommended by

The Electrical League of Cleveland

Cleveland League's Lighting Booklet

North, president of the league, reports that one of the contractor members has wired fifteen of these homes and that the average increase in the electrical bill over what the old plans called for was about \$150 per house.

Seventeen of the electrical contracting firms in Cleveland have gone a step further than this. They have sensed the possibilities of applying the league plan to old homes whose wiring and fixturing has not been brought up to standard. These organizations are making a real effort to get this rewiring and refixturing business.

These companies have issued bulletins to home owners offering without obligation on the part of the latter to look over the wiring and lighting equipment in a home and furnish an estimate on the cost of improvements that

they would recommend to make the home more comfortable, more convenient and more attractive.

The league has prepared a booklet, "Lighting the Home," which is given to all interested. It contains 43 pages of useful electrical information for the home owner. The proper lighting of each room is taken up in detail in the fore part of the book, and twenty pages are given over in the rear to various types of lighting fixtures designed for each room, together with a list of the league members who sell each type. Each fixture is illustrated and priced, completely installed. Another booklet deals with the league's standard house wiring specifications. These have been revised as of June 24 and are carried here in full.

Specifications for Minimum Outlets in Residence Buildings

EXTERIOR ENTRANCES—One ceiling or one side outlet. One single-pole switch.

PORCHES—One ceiling or one side outlet. One single-pole switch. One convenience outlet (three feet high) if floor area is in excess of 100 sq. ft.

VESTIBULE—One ceiling or side outlet and one single-pole switch if floor area is in excess of 16 sq. ft.

HALL—One ceiling outlet and one single-pole switch. If there are two doorways more than 10 ft. apart, two three-way switches. One convenience outlet for each twelve lineal feet of usable wall space.

STAIR HALL—One ceiling outlet and two three-way switches. One convenience outlet for each twelve lineal feet of usable wall space.

LIVING ROOM—One ceiling outlet if room is nearly square. If length is more than one and one-half times the width two ceiling outlets, or four side bracket outlets may be substituted for one ceiling outlet or six side bracket outlets may be substituted for two ceiling outlets. For one doorway, one single-pole switch. For two doorways more than 10 ft. apart, two three-way switches. One convenience outlet for each twelve lineal feet of usable wall space.

SUN ROOM—One ceiling outlet. For one doorway, one single-pole switch. For two doorways more than 10 ft. apart, two three-way switches. One convenience outlet for each twelve lineal feet of usable wall space.

DINING ROOM—One ceiling outlet. For one doorway, one single-pole switch. For two doorways more than 10 ft. apart, two three-way switches. One convenience outlet for each twelve lineal feet of usable wall space.

BREAKFAST ROOM—One ceiling outlet. One single-pole switch. One duplex convenience outlet just above level of table top.

KITCHEN—One ceiling outlet. For one doorway, one single-pole switch. For two doorways more than 10 ft. apart, two three-way switches. One ceiling or side outlet over sink controlled by switch or pull chain. One duplex convenience outlet three feet high near sink.

REFRIGERATOR ROOM—One ceiling outlet. One single-pole switch. One convenience outlet in refrigerator room or in basement.

REAR HALL—One ceiling outlet. For one doorway, one single-pole switch. For two

doorways more than 10 ft. apart, two three-way switches.

HALL, SECOND FLOOR—One ceiling or side outlet. Two three-way switches. One con-

This house has been

WIRED BY _____

FIXTURES INSTALLED BY _____

Date completed _____

Issued by

THE ELECTRICAL LEAGUE

OF CLEVELAND

No. _____ BY _____

Paster for Panelboard of Approved House

venience outlet not less than 3 ft. from floor.

BEDROOMS—One ceiling outlet. One single-pole switch. One convenience outlet for each twelve lineal feet of usable wall space.

CLOSETS—One lighting outlet controlled either by pull chain or door switch if floor area is in excess of 10 sq. ft.

FOR SALE

WIRED

AND LIGHTED

AS SPECIFIED

BY THE

ELECTRICAL

LEAGUE

Sign for Front of House For Sale

BATHROOM—Two side wall outlets, one on each side of mirror located five and one-half feet from floor. One single-pole switch. One

duplex convenience outlet at right of lavatory about 3 ft. from floor.

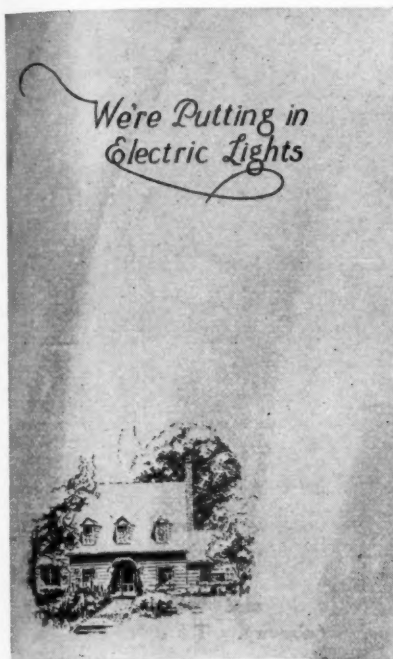
BASEMENT—One ceiling outlet for each 150 sq. ft. of floor area. One switch located at head of stairs (preferably in kitchen) to control all general lighting outlets in basement.

LAUNDRY—Two ceiling outlets, one over laundry trays, one over ironing machine. One switch if laundry is enclosed. One outlet in ceiling, 2 ft. in front of and on line with right or left end of laundry trays for clothes washer. One convenience outlet for hand iron and ironing machine.

FRUIT ROOM—One lighting outlet.

BOILER ROOM—One lighting outlet.

COAL ROOM—One lighting outlet.



Cover of Pittsburgh League's Attractive Rewiring Brochure (above). Inside Pages, (right) Containing Reasons for Rewiring the Home

Van Aernam reports that the plan has not been in operation long enough for him to make any statement as to its effectiveness.

Pittsburgh's Effort

The Pittsburgh brochure is particularly attractive in appearance and design. It is a folder proposition, the inside double page being devoted to a letter from Mr. Van Aernam to the purchaser of a house, pointing out the advantages of adequate wiring and lighting. The fact that a new owner usually wants to do repairing and alteration work of various kinds prompted this

ELECTRIC LEAGUE of PITTSBURGH
318 Westinghouse Building
PITTSBURGH, PA.

Phone Atlantic 1311

"We're putting in Electric Lights."

Had you been purchasing a home twenty-five years ago you would have made that statement with great pride, and rightfully so.

In a few years we have traveled far in the improvement of wiring to keep pace with the science of lighting and the many uses of electric service because without proper wiring electric service is less satisfactory.

Take the home you have purchased as an example. Unless it is different from thousands of houses the wiring installation according to present day standards and your own desires is INADEQUATE.

Worse still, there may have been changes in the original wiring by an amateur that may even cause it to be unsafe. It is, therefore, important that you consult a competent, reliable contractor, allow him to make a survey and at the same time inquire about the cost of modernizing your wiring system. It will be surprisingly low.

These suggestions are based on the collective experiences of a trained staff of men studying home wiring problems. If we can be of any assistance do not hesitate to write or telephone us. It will place you under no obligations. Our services are free.

Electrically yours,

ELECTRIC LEAGUE of PITTSBURGH

J. H. Van Aernam
Manager



P.S. You will undoubtedly indicate your home is in need of rewiring. Let us greatly assist you in the changes you hope to accomplish.

SINGLE GARAGE—Two ceiling outlets 5 ft. from rear wall and 8½ ft. apart. One outside outlet. Two three-way switches, one in garage and one inside of house. One duplex convenience outlet on center of rear wall 3 ft. from floor.

DOUBLE GARAGE—Three ceiling outlets 5 ft. from rear wall and 8½ ft. apart. Balance of requirements same as for single garage.

The Electric League of Pittsburgh has started a movement to push rewiring and refixturing in the old home, and to this end has prepared a brochure giving salient information for such a buyer. These brochures are sent each day to the names that are recorded as having purchased old homes and every morning a batch is put in the mails as soon as the list is received. Manager

effort, which calls to his attention the importance of including the electrical equipment in the changes planned. Immediate results are not expected from this effort, it being reasoned that a new owner really does not know what changes to make until he has lived in a house for some little time and has had a chance to look around a bit to see what the place needs.

The Toledo league's rewiring activity has not yet taken any concrete form. Temporary plans are being prepared for it, but until they have been completed and ratified by the board of directors no definite announcement can be made.

Cooling and Warming Effect of Light

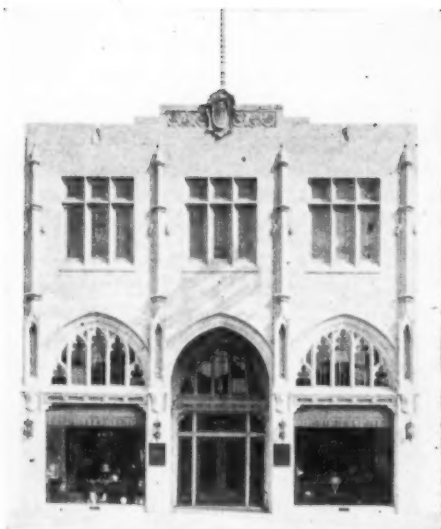
It is well known to the decorator—and instinctively to most of us—that colors have individualistic powers, according to M. Luckeish, director of Lighting Research Laboratory, National Lamp Works of General Electric Company, Nela Park, Cleveland, Ohio. One may be stimulating, another soothing, and a third may be depressing. Some colors are "warm"—red, orange, yellow. Others are "cold"—violet, blue, blue-green, green and yellow-green. An expert will plan a "cool" decorative scheme for a room which receives a great deal of direct sunshine. He will use a "warmer" scheme in a room which is exposed to the cold light of the northern sky. But actually color is in the light and, therefore, the quality of the light influences the warmth or coldness of the decorative scheme.

We meet summer with summer clothes. Through flowers, foliage, summer draperies and slip-covers for furniture we show our tendency and desire to "cool" our interiors. We scarcely can afford to redecorate interiors twice a year—for summer and for winter, respectively. However, this is where lighting well demonstrates its superiority over other media of expression. Lighting effects are mobile—decoration and furnishings are relatively fixed. A change in the electric lamps works wonders. Where the proper equipment is available a switch can convert an interior from a warm one for winter to a cooler one welcomed in the summer time. The apparent change in temperature may be equivalent to a number of degrees. This is not true in reality, but it seems so—and that is the important thing.

These powers of color are real and they have been adequately studied in the laboratory and in actual installation. Such studies resulted in the development of flame-tint lamps, for example. A room perfectly lighted by this warm light in winter time would seem cooler in midsummer if daylight lamps were substituted. There are tints of blue and green available where stronger effects are desired.

Such an expression as "This theater is cooled by light" is justifiable. Lighting cannot take the place of refrigeration in the preservation of unfeeling things, but it can go part way in the case of human beings.

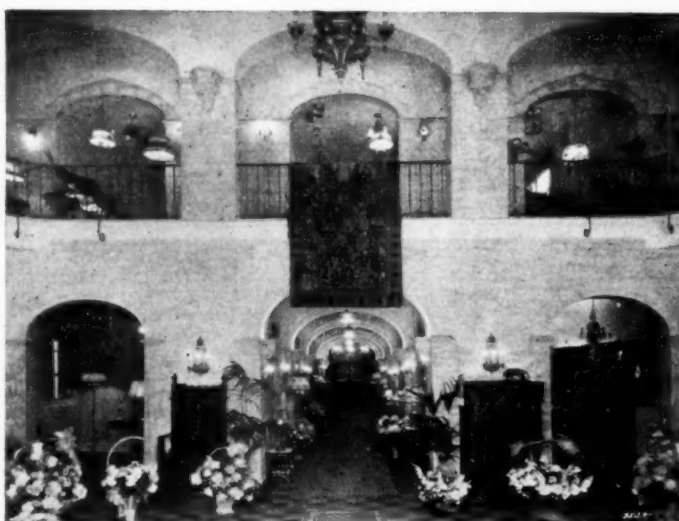
Atlantic City Electragist Opens New Store



The L. L. Jones Company has moved into a new building at 3112 Atlantic Avenue, which contains what has been called one of the most beautiful electrical stores in the country. The new structure, which is as complete and as nearly perfect as possible in every detail, marks the twenty-seventh year of the company's existence under one management.



The exterior of the building (above) shows the lines of Gothic architecture. The mezzanine around reception room (right) contains the general offices. The beautiful reception room on the first floor (below) runs the entire width of the building and is two stories in height, with a domed ceiling



Looking through the rooms showing typical dining room, living room, bedroom, kitchen and bathroom lighting (above). The second-floor showroom shown below contains a general display of lamps and occasional furniture. The front end is the mezzanine surrounding the reception room on ground floor.



Estimator-Superintendent Relationship

What Should be the Relationship Between the Estimator and the Superintendent? Should the Estimator Superintend His Own Work? What Are the Duties of Each?

THE problem of the relationship between the estimator and the superintendent was presented to THE ELECTRICIST, and in order to secure an answer based upon experience a series of questions was sent to a number of contractors whose volume of business runs into large figures. Obviously this is not a problem for the small organization.

Fourteen very interesting replies were received and these are given verbatim because in each case they represent the actual practice of each company. About 30 percent of the replies were opposed to placing the responsibility of superintending the work in the hands of the man who estimated the job. The remaining 20 percent inclined the other way.

It is interesting to note, however, that the character of work in the two groups is for the most part quite different. With one or two exceptions those who favor separate departments confine their efforts almost entirely to very large work. Those in the other group, while they handle a large volume of business, as a rule are working on much smaller work. This may or may not make a difference, but at any event the fact was quite evident from the replies.

Work of Each

When confronted with this problem the contractor must first have clearly in his mind what the work of an estimator is and what is that of a superintendent. If the estimator is to be a solicitor as well, and this is a very common practice, can he be a good superintendent as well?

If the superintendent must estimate as well he can do so only after hours and Sundays. Will he be more likely to make mistakes because of mental fatigue? Can he, under such conditions, be expected to be careful in reading specifications, taking off quantities, pricing?

If an organization is large enough to have more than one estimator and they are superintendents as well, does it not involve a labor supply problem? Each superintendent and estimator would demand his own crew.

If the dual function is reposed in one man, would he be more or less likely to catch and correct errors in price, layout and quantities than if the work were performed by two men?

These are the questions a contractor must ask himself and generally such an analysis will automatically suggest the right answer.

All contractors do not delegate exactly the same functions to each man. There are some who give the estimator more latitude and some less. This of course generally depends upon the principals' relation to the work, upon the fitness of the men, upon class of customers. In other words, no hard and fast rules can be laid down, but those interested in the problem will find considerable food for thought in the methods of operation of the companies which answered the questions asked.

Estimator Should Not Superintend

It is our opinion that the estimator should make the layout in advance in accordance with his estimate and then turn the plans over to the superintendent. The superintendent then checks the layout and if he finds any errors or a better way of installing the work he has the privilege of changing the plans.

The estimator should not be required to superintend the work for the reason that he is too busy with estimating work. The estimator should not be disturbed with telephone calls from the job. We do not believe that this would be good practice.

Kuehne Electric Company,
Detroit, Mich.
J. H. KUEHNE.

Superintendent Responsible

We have several estimators and a superintendent who looks after the men. The estimator figures the job, sells it to the customer and then goes with the superintendent and the chief mechanic to the job and lays out the work in the presence of both, together with the customer. From then on the responsibility rests with the superintendent, whose sole duty is to visit the various jobs daily and see that the men do the quantity and quality of work they are expected to do. The estimator, however, who secured the job would upon completion of the work make an inspection of it and pass on it. During the course of construction the estimator should check the job and see that everything is progressing nicely.

Laube Electric Corporation,
Rochester, N. Y.
G. FRED LAUBE.

Separate Departments

Within our organization we have individual estimating, engineering and construction departments. The function of the estimating department is to prepare estimates upon which proposals are based. After the contract is secured the engineering department prepares detailed working drawings, which are made in the closest cooperation with the estimating department. The latter department is familiar with the cost of the job, and the general superintendent, who is familiar with the physical conditions in the field and is in possession of expert knowledge as to the methods to be followed in doing the work at the estimated cost, or better. We rather lean on the idea of making the engineering department a service arm of the construction department.

Any errors which have crept into the estimate are usually discovered during the preparation of shop or working

drawings, due to the fact that there is a triple check at this time by the estimating, engineering and construction departments. The close cooperation of these three departments applies to all phases of the work, from the fixing of the labor allowance in the original estimate through the purchase, delivery and installation of material, to the certificates of completion and final payment.

L. K. Comstock & Company,
New York City
L. K. COMSTOCK.

Reasons for Trouble

I am of the opinion that most of the trouble that is experienced in the relationship between estimators and superintendents is caused by either one of two things, namely: Lack of coordination in the contractor's organization which precludes good team work between the various departments, or the handling of work without the proper layouts, or, what is worse still, deliberate perversion of proper layouts by the contractor after obtaining the work.

I don't think that either an estimator or a superintendent as such should make engineering layouts on work of any consequence, since these layouts should be made before the work is estimated, and without the expedience which usually creeps into the estimator's attitude toward the work.

After a proper layout is made, either by the contractor or some other agency, the question of taking off the quantities and establishing the cost, and then of superintending the installation of the work is a routine matter in which no serious error should be possible since a proper plan and specification on a piece of work of any consequence whatever should produce mutual understanding among all parties concerned and thereby avoid the question of errors.

As a routine matter and as an economical matter of operating it is my opinion that estimators must of necessity be a somewhat different type from a supervisor of the work. To handle a considerable amount of work it would be impossible to carry the individual item to the extreme of having every estimator supervise all the work he obtains. It would be impossible and uneconomical.

Hixon Electric Company,
Boston, Mass.
ALFRED J. HIXON.

Close Contact Necessary

We are of the opinion that there should be very close contact between the estimating department and the superintendent. In fact, so close that daily conferences should be held in order to avoid mistakes.

We believe that the estimator should be held responsible for all quantities of materials and the making up of layouts, and that the superintendents should be responsible for the proper installation of all settlements in accordance with layout specifications. If any errors occur we feel that they should be brought up and corrected daily.

The Howard P. Foley Company,
Washington, D. C.
HOWARD P. FOLEY.

Can't Combine Them

It is my opinion from long experience that you can't have an estimator as superintendent. We have the estimator in the office to supervise a distinct set of plans and write engineering instructions, as we call them, covering all the details of the job on which we have estimated, so that our men may follow them. I don't think it is possible to combine the two.

Peet & Powers, Inc.,
New York City
W. CREIGHTON PEET.

Estimator Solicits, Too

We have tried having the estimator superintend his own work, but in our organization an estimator is also a solicitor and while he is completing one job he neglects getting any new work. So we have decided that an estimator not only is an estimator, but a solicitor as well, and we have given each one of our estimators a helper to take off quantities and prepare the estimate from plans. In addition, this helper gets out all wiring plans, which are checked by the estimator.

Then we have a general superintendent who takes the entire responsibility of all jobs, and any questions arising must be taken up by the solicitor, or estimator, that received the job. This allows our estimator to have free rein and he only needs to bother with the job when questions arise, such as figuring on extras and dealing with the owner or architect.

We have been operating in this way for some time and find it very satis-

factory. I might say that our estimator, with the assistance of the helper who has taken off the quantities of the job when figured, makes all layouts which are checked by our superintendent, and if any changes from the original layout are made it must be taken up with our estimator first, as he has reasons for his layout.

Kelso-Burnett Electric Company,
Chicago, Ill.
JAMES O. KELSO.

Layout Estimator's Job

The problem of the relation of estimator to superintendent is an interesting one. We have given it much thought during the past; in fact, we have tried out various procedures, all of which were discarded, except the one which we now follow and which has been in effect for about six years.

In our organization the estimator of any particular job is responsible for the layout, the purchase of all materials except incidentals, the scheduling of progress, the issuing of proper instructions to the superintendent. He has executive supervision over the job and is entirely responsible to the company for the successful completion of the work. In a sense he is what might be termed a project manager, the only items on which his decisions are not final being the amount of overhead and profit to be added to job cost, accounting, credit risk, billing and collection.

The superintendent receives his instructions from the estimator and is responsible to him. The superintendent selects and employs the foreman, mechanics and helpers, and performs all of the usual duties of superintendent, except that he does not do any change-order estimating, engineering or layout work that can be performed in the office. We consider that the major part of the superintendent's time can be spent more profitably in the field rather than in the office.

Woodfield-Thompson Company,
Philadelphia, Pa.
ARTHUR M. WOODFIELD.

Work Together

We discussed the question of the relationship between estimator and superintendent at a recent meeting and it was agreed that the estimator should stick to estimating jobs and the superintendent should do nothing but run the jobs,

but at that the estimator and superintendent should work together as closely as possible during the progress of the work. The estimator ought to visit the job at least once a week to check up on things in general and to give the superintendent special information as required, and the superintendent should in turn check up with the estimator in the office from time to time to get information from him and to compare the actual working out of the job with the original estimate.

About six or eight years ago we tried the scheme of having the man who estimated the job actually get out on the job to superintend the construction work, and while this method may have some advantages we decided that there are other disadvantages which made the former scheme preferable.

Herman Andrae Electrical Company,
Milwaukee, Wis.

GEORGE ANDRAE.

Many-sided Estimator Rare

In the early 90's electrical construction was limited compared with the volume of today. In those days the entire staff of a contractor even in this city usually consisted of one or more principals, a superintendent and possibly an estimator. The principals, and in most cases the superintendent, had engineering and construction knowledge. This also applied to the few estimators then employed.

The principals and superintendents and such contractors who had an estimator did not alone do the estimating, but also looked after the construction. Consulting engineers were very limited in number and very few of these furnished complete plans, and we might say that one or two furnished a so-called feeder sheet, or riser diagram, giving the size of conductors, the usual method being simply to specify a certain percent drop between the source of supply and the last lamp on the installation with all lamps burning.

I am quoting my recollections. The result of this system was that the principal contractors made their own plans with circuit layout, feeder sheets, etc., even drawings of switchboards, panelboards, etc., with the result that every one connected with the installation, such as the principals, superintendent, foreman on the job, was familiar with what the estimate was based on. The

work was installed in accordance therewith.

Today electrical construction has so greatly increased that the principal contractors throughout the country find it necessary to have a greatly enlarged organization consisting not only of principals, but a general superintendent, engineering and drafting staffs and estimators.

Even with the more complete plans and data, together with specifications furnished by the consulting engineers of the present day, we, and I believe a majority of other principal contractors, also, make construction plans, any change in plans of course to be approved by the consulting engineers. These plans are based in a general way on the estimate. The general superintendent is perfectly familiar with the basis of the estimate. The contractor's own plans are derived from the estimator's basis and general consultation between the engineering staff, superintendent and in some cases the principals.

In my opinion it does not seem feasible or proper that estimators who figure jobs should follow them and lay them out, then turn it over to the superintendent for actual installation.

Estimators who are able not only to estimate the job, but lay it out and superintend it as well are few and far between, and the contractor with any considerable volume of work could not conduct his business successfully in endeavoring to confine all these duties to one man.

The problem, however, is one that each contractor must solve for himself. It depends on the character and volume of his work and the ability of the principals and their employees.

Hatzel & Buehler, Inc.,
New York City
JOHN C. HATZEL.

Estimator Should Do Both

We feel that it is up to the estimating department to be responsible for the entire job and that it should work with the superintendent to carry out the work in the manner it was figured.

The estimator should not only be able to figure and lay out the jobs, but to superintend them as well, and that he should superintend some of the larger jobs himself. By so doing he associ-

ates himself with the class of work he is doing and this gives him a greater knowledge of estimating, since the only way he can obtain this knowledge is by keeping close tab on the labor cost, which is the hardest thing to overcome in contracting.

We feel that a competent superintendent would catch any errors made in layouts by the estimator, but we also feel that the estimator would also catch any errors made by himself when the work is in progress, for sometimes these layouts are hurriedly made and after a man has a second thought he finds his mistakes if there are any.

Monroe Electric Company,
Tampa, Fla.
W. S. MONROE.

Estimator Should Superintend

It is our opinion that the man who estimates the job should also superintend its installation. Of course, our concern is a relatively small one, but regardless of this fact I do not see that there is anything to be gained by having an individual other than an estimator oversee the installation of the work.

Should the estimator figure only he becomes a mere pricing clerk and the superintendent, who lays out the job and also superintends its installation, has the entire responsibility, which we feel is not as it should be.

Dauphin Electrical Supplies Co.,
Harrisburg, Pa.
A. J. MUSSER.

Estimator Sees Job Through

In addition to the two principals of this company we have an estimator but no superintendent. All three of us act as estimators and the one who estimates a job usually follows it through, eliminating any mistakes that might occur if he had to make a layout and then transfer it to a superintendent.

However, our work consists mostly of industrial with a small percentage of commercial work and our plan might not work out so well on large new-building work. The writer has always felt, nevertheless, that the man who estimates and lays out the job is most capable of superintending it.

Fife-Pearce Electric Co.,
Detroit, Mich.
H. B. FIFE.

A Father-and-Son Contracting Firm Forty-five Years Old

The Herman Andrae Electrical Company, Milwaukee,
Has Completed Over Two-Score Years in the Contractor
Branch and Has Seen Many Changes in the Industry

THERE are not many firms in the electrical contracting field that have been called upon to replace with a more modern type a piece of electrical equipment that the same firm had installed thirty-six years before, and there are still fewer which can say that the installation was made by the fathers of the men who did the replacement work thirty-six years later.



Herman Andrae
President and Treasurer

This interesting sidelight on an electrical contracting firm came to be known during the recent anniversary of forty-five years in business celebrated by the Herman Andrae Electrical Company, 2040 Clybourn Street, Milwaukee, which has seen the steady growth in the electrical art from the days of the first central station.

Back in 1890 Herman Andrae and Jack Tellier, members of this organization, received an order to install a dynamo in the plant of the Layton Company, pork packers, in Milwaukee. The same electrical company has recently completed the modernizing of the Layton plant and the replacement of the dynamo after these years of service.

This work was done by George Andrae and Arthur Tellier, sons of the men who made the original installation.

This old dynamo which gave such faithful service was built by the old Mather Electric Company, which has long since been absorbed by another company, and bears the serial number 742. It is rated at 60 amp., 125 volts, 2,160 r. p. m. The base of the motor on which the exposed terminal posts are mounted is of wood, an interesting fact in view of the modern methods of manufacture. The machine stands about 48 inches high, as compared with a height of 16 inches of a modern machine of equivalent output. It occupies more than three times the floor space of the present-day machine.

The business now known as the Andrae Electrical Company was founded in 1882 by Herman Andrae, president and treasurer of the present company. He was joined in 1888 by Jack Tellier, who is still with the company. Ten years later A. G. Tellier, a brother of Jack, went to work for them. Then in 1916 George Andrae, son of Herman, after completing his education in the



George Andrae
Vice President and General Manager



The Dynamo After 36 Years of Service

engineering college of the University of Wisconsin, came into the organization as vice president and general manager.

How Times Have Changed

Herman Andrae's introduction into the electrical business came as a natural result of his being in the locksmith business with his father. This business at that time included the installation of pull bells, and with the advent of the electric bell those following that trade naturally took up the new idea. Accordingly his father sent him to Philadelphia in 1881 to get some electrical knowledge. There he was employed by Robert A. Bell, who was doing some electrical bell work. Young Andrae also spent some time in other cities before returning to Milwaukee to take up the newly instituted electrical work in his father's employ. One of the first electrical jobs they landed was to install an annunciator system in a hotel connecting its four private dining rooms with the bar on the first floor. Electric gas lighting was a natural addition to the activities of the company, and this was looked upon, according to Mr. Andrae, as quite an accomplishment, enabling one to light the gas by merely pushing a button.

After a time motors began to make their appearance, and one of the first

they installed was rated at 550 volts and was fed from a street railway circuit. This practice was so dangerous, however, that the motor was encased in a brick and steel room. Fluctuations in current caused irregularity in the motor's speed when the load on the railway was heavy. When the cars ran up a steep hill nearby the motor would slow down considerably and a few minutes later would pick up speed and run away, necessitating an adjustment of the brushes.

Lighting Comes Along

Electric lighting came along after the motor began to demand much of the company's time, and one of the first installations was in a plant where lights were required above the benches of the workmen. This was accomplished by running five 100-watt lamps in series, using Bernstein sockets and lamps made in New York. When home owners made a request for service to the local central station they were required to have eight lights in the house. If it was a small house using less than the required eight the remaining two were hung somewhere



Jack Tellier
Superintendent

Specializing on Industrial Work

outside in the yard, since eight lights were required to form a circuit.

Central Station Did Wiring

When the first central station was formed in Milwaukee it did not permit wiring in houses to be done by the contractor, but reserved this work for itself. Sometimes, however, according to Mr. Andrae, a contractor could sell an

owner and in that case would be selected to do the work, much to the chagrin of the central station manager, which sometimes resulted in a threat not to connect the service. They were able later to convince the utility that it would be more to the advantage of both if the Andrae company were permitted to carry on its wiring activities without any ill feeling on the part of the central station.

Covered Wide Field

At this time there were no electrical contracting firms versed in the wiring end of the business in the inland towns of Wisconsin, and the Andrae company was called upon to do work in various parts of the state. In LaCrosse many installations were made, and work was done also in Chippewa Falls, Beaver Dam, Waukesha, Racine and other cities. One of the great difficulties in those days was the lack of standardization of wiring supplies.

The wire used in those days was none too good, and the appearance of rubber-covered conductor made a wiring job more satisfactory from every standpoint than it had been previously. All wiring was run through holes bored in the joists carrying the floor, and paper bushings saturated with oil were used until porcelain tubes were introduced. To make what was considered in those days a neat job the wires were run in wood moulding when at right angles to the joist, and when running parallel they were fastened to the joists with wooden cleats.

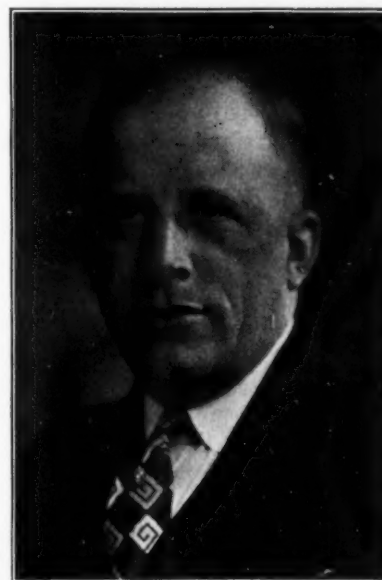
Government Work

The steady advance in the electrical art and the reputation of the Andrae company brought it considerable business even from far distant points. One notable job was that done in the palatial residence of one of the citizens of Los Angeles. The United States Post-office Department had its work done by the company and installations were made in postoffices all over the country.

Mr. Andrae recalls some highly interesting facts concerning the difficulties he used to experience in purchasing electrical supplies in those days. There were no jobbers in existence, of course, and the number of manufacturers in the field was limited. All buying was done direct and the late Charles W. Holtzer was among those with whom the contracting organization did its business.

The Holtzer concern was located in Boston, and there were two in New York and a fourth in Philadelphia and since the Andrae company was located in Milwaukee it was no easy matter to get electrical supplies with any degree of speed.

The old Electrical Supply Company of Chicago was one distributing house that came into being about this time, and Mr. Andrae recalls an order he gave this concern that seemed so big in those days that it was passed around among



A. G. Tellier
Superintendent

Specializing on Commercial Work

the employees as something extraordinary. The order called for 10,000 ft. of No. 14 wire.

The wiring accessories then were very crude and hazardous. The cutouts and ceiling rosettes were made of hard wood with brass attachments and fuses were something unknown. Fuse wire was used in their stead and this was made from 1/2 to 100-amp. carrying capacity, and the handy man around the place was not particular what size he used as long as it did not blow.

The growth of the Herman Andrae Electrical Company has been steady since that time. Two years ago they moved into their own new building and limited their activities almost entirely to contracting work after a ten-year trial of electrical merchandising. From forty-five to seventy-five men are on the payroll throughout the year.

Another Tellier has joined the Andrae ranks. He is a son of Jack and nephew of A. G. Tellier.

"About 75 percent of all failures after the World War could have been avoided if the merchants had concentrated their purchases with a few houses There were too many small creditors who wanted their money."

The Fallacy of Buying from Too Many Jobbers

By WALTER P. HOAGLAND
Manager, Chicago Office, Graybar Electric Company

FOR a great many years we have been hearing the homely admonition, "Don't put all your eggs in one basket."

There is nothing wrong with this principle, but in putting it into practice many have exaggerated it to the extent that they regard it as dangerous to trust more than one egg to a basket. One egg, one basket, with the result that no individual basket is of any particular consequence and more broken eggs result than if there had been several well filled and carefully guarded baskets.

I wonder if purchasers of goods, electrical and otherwise, have not applied this "eggsaggerated" view of things to their buying habits, adopting as their motto, "Don't give more than one order to any one concern."

It is almost a matter of religion with many buyers not to let anyone selling goods gain the idea that his house is being more favored than his rivals'.

"Keep them all guessing," says this type of buyer, "and prices will come down. If I were to let any salesman think I would rather deal with him than his competitor his discounts immediately would be shortened. I make my overhead by picking out the bargains from among the offerings of a dozen different jobbers."

The fallacy of such reasoning lies in just one thing—that the buyer fancies himself entirely independent of the agencies from whom he purchases his goods, and that is not the fact.

What is the attitude of the jobber or distributor toward a buyer of this sort? He knows the account will never be profitable—not that he quotes any better prices—but that the cost of this type of selling eats up the margin on which he has to operate. The account being small, he is not inclined toward any



Walter P. Hoagland

special indulgences in the way of credits, allowances, returns, etc. He simply drops in when he is in the vicinity, quotes his prices and departs. Bye and bye, he ceases to call and the wise buyer does his ordering from a catalogue perhaps "Cash with order."

The Jobber and the Good Account

On the other hand, what is the attitude of the jobber or distributor toward the account which is giving him a real portion of its business? To begin with he knows it to be a profitable account. He can afford to quote lower prices to secure such business, and he realizes he must do so in order to retain this position. He will go the limit in extending credit, accepting returns and rendering special service. He is in a sense, a partner in the business and any help he can bring—and with his broad experience in the merchandising field there is much he can bring—is gladly proffered. Enjoying the confidence of his customer, there is no impulse to oversell or overstock, for the customer's

best interests are identical with the seller's. He counsels with the customer and then throws in all the facilities of his organization to make good his recommendations.

And here's another side—rather gloomy but so vital as to demand consideration. To almost every business there come times of stress—times when sales are slow, collections hard and inventories high. If the business is one which has scattered its purchases among numerous different suppliers, none of them has any very large financial or personal concern in the matter and each is inclined to enforce settlement in the most direct way and salvage what he can. Were there but two or three creditors each would have a vital interest in the matter, not only to collect the substantial amount owing them but to avert the loss of a valuable outlet. There would be personal ties, too, for no one can do business on an intimate basis without forming friendships. Extensions would be granted, advice and assistance rendered and every effort put forth to tide over the emergency.

Speaking along this line Mr. Edward M. Skinner, vice-president and general manager of Wilson Brothers, recently said: "I have stated and firmly believe that about 75 percent of all failures after the World War could have been avoided if the merchants had concentrated their purchases with a few houses. Most of them had ample assets but there was no market at this time. If aided or even left alone, they would have worked it out, but there were too many small creditors who wanted their money. Concentration means greater profit and less debts. It means a few good strong houses interested in your business and success, instead of many with so small an interest as to be a menace rather than a help."

Efficient Methods in a Motor Repair Business

A Simplified System Which Takes Care of Every Detail of the Business Has Been Worked Out by Venino Brothers & Company, Electragists, Who Do a Large Business in New and Used Machines and Keep a Force of Twenty-five Busy on Repair Work



The "Venino-built" Nameplate

IN HANDLING a business devoted to the sale of new and used motors and motor repair work of all kinds, Venino Brothers & Company, Newark, N. J., have introduced a system of recording transactions that gives immediate information and at the same time forms a permanent record for future reference if necessary.

The company's annual volume of used motor business runs into large figures, about \$70,000 worth being turned over every year, with approximately the same figures for new machines. The volume of repair work handled both in and out of the shop keeps twenty-five men busy at all times.

The executive offices and shop are located at 65 Hamilton Street and the stock of motors, some 2,000 in all, is kept in a warehouse at 251 South Street, a few blocks away. The main building is a two-story and basement structure, the first floor being devoted to the shop and an office for the shop manager. The second story is given over to the accounting and administrative offices of

the organization and the stock room. The testing apparatus and ovens are located in the basement.

The used motors that the company sells are reconditioned after purchase and are sold under a guarantee for one year. None of these motors is purchased without first being passed through an inspection that brings out any needed repairs and replacements to make them first class in every respect. Some dealers give a flat price per horsepower, but it is not the policy of the Venino company to quote a price until this inspection has been gone through.

When the company receives a motor for purchase it is received first at the warehouse, where a thorough inspection is made of it. When this has been done a receiving slip is made out for the machine. This shows all the characteristics of the motor, the name of the seller, date purchased, voltage, amperage, horsepower, etc., every possible feature being covered. It also shows what repairs are necessary before the motor can be resold as "Venino-built,"

which means that the company has placed its label on it and stands back of its performance for a year.

These slips come into the office of Mr. Venino, who first figures the cost of putting the motor in condition and then quotes a price to the seller. If accepted the motor is sent to the shop for repairing. New motors are also sent to the warehouse from the manufacturer and a receiving slip is made out for them as well. These, of course, contain all the characteristics of the motor, but show that it is a new one.

If the price allowed for the used motor is acceptable to the seller a blue card is made out with all the necessary selling data on it, including the cost price and selling price. The card is then placed in its proper place in a revolving permanent visible file which is on Mr. Venino's desk. In the case of new motors white cards are used. The file is so arranged that only the last line is visible. Twenty leaves, each holding one hundred cards, are provided. Each of these leaves is marked

For		Job No.
Address		Date
		PHONE
		FAX
Nature of Work		
Stop	Work Finished	Work Unfinished
Start		
Elapsed Time		Estimated Time
Employee		
Customer will kindly sign here		
Employee full report on back of sheet		
OVER		

MAINTENANCE Time Sheet
VENINO BROS. & CO.
65 Hamilton Street
Newark, N. J.

Stop	VENINO BROS. & CO.		Date
Start	Shop Time Sheet		Clock No.
Stop	Customer	Job No.	
Start	Stock No.	Work Finished	Work Unfinished
Stop	Nature of Work		
Start			
Stop			
Start			
Stop	Employee		
Start	Additional Remarks on Back of Sheet		
TOTAL TIME		OVER	

The Maintenance Time Sheet (left) and Shop Time Sheet

at the top to show the type of motors that are listed on it. These markings include single-phase, two-phase, three-phase, direct-current, the various voltages, etc. Since blue cards are made out for used motors and white ones for new machines, it is a simple matter to

Venino Bros. & Co., Inc.
Warehouse 251 South Street, Newark, N. J.

RECEIVING SLIP

No. _____ Date _____ 19__

From _____

Order by _____ Order No. _____

Maker _____ Model No. _____
S. V. A. _____ Ser. No. _____
S. W. _____ DEG. _____ Shop No. _____

Voltage _____ Amp. _____ ()

R. P. M. _____ Type _____ A. C. _____ D. C. _____

New _____ Old _____ Veninobuilt _____

Pulley _____ Base _____ Balls _____

Shifter _____ Type _____

Tested _____

Remarks _____

Returned from _____

Credit Rent _____ Purchase _____ Repair _____

Exp. Chg. _____ Chg. Slip No. _____

Via _____

Placed in Division No. _____ Checked by _____

Receiving Slip

turn to the proper leaf when a request comes in for a new or used motor of certain characteristics.

Rebuilding Motors

When a used motor is put through the shop for the necessary repairs and replacements it takes its order and work is done on it when the time of the men in the shop is available.

Customers' motors sent in for repairs, like the motors that are being rebuilt, are assigned job numbers and the job record is kept on shop job sheets. One of these sheets is here shown, and it will be noted that the left side of the sheet is prepared for indicating the time required. This time is punched by an automatic job time recorder which does away with all errors as a result of the human element. There are cases where a mechanic may be called off that job to be sent out on a maintenance call, and if so he marks his stopping time on the card and stamps it again when he returns to the work. The time between the stopping and starting times will be indicated on the sheet he has used on his service call, if such is the case.

On maintenance calls outside the shop

another style of slip is used. This is arranged somewhat differently from the shop sheet and is salmon in color. This sheet is also shown. It will be noted that there is a space arranged for the customer's signature after the job has been completed. An inflexible rule of the company is that such a signature must be obtained on all outside work, failure to secure them holding up the pay of the mechanic who was on the job until it is secured. Further, no repair work of any nature, whether in the Venino shop or in the plant of the customer, will be undertaken until a written order has been received authorizing it. Verbal orders will not be attended to, and if a mechanic is sent out on a maintenance call which was received over the telephone he will not start work until a written authorization has been given to him. Both of these rules eliminate all possible quibbling over authorization to do the work and as to time required, according to Mr. Venino, and in the latter case the customer's signature indicates that the work has been finished properly and that the man



Visible Record of Motors

required the time he has marked. A further requirement is that the employee indicate on the back of the sheet just what work he has done. Mr. Venino knows the approximate time required to do the work and this gives him a line on the ability of the mechanic and at the same time is a check on any questioning of the bill, all work being on a time and material basis.

All records pertaining to the jobs, which are indicated by number on the sheets, are kept in folders. These include the authorization to do the work,

time sheets, material lists, etc. The job number is indicated on the upper left hand corner of the folder and the bill number, when it has been sent out, goes at the right. An interesting feature of

Maker's No. _____
Serial No. _____
Style No. _____

Shop No. _____

VENINO BROTHERS & CO.
MOTOR RECORD

Maker _____

Type _____ Model _____ Size _____
Class _____ Form _____

Horsepower _____ Frame _____ K. W. _____

Speed _____

Volts _____

Ampere _____

Phase _____ Cycles _____ Deg. C. _____

Winding _____ Poles _____

Armature No. _____

Shaft Diameter _____ Keyway _____

Brushes, size _____

Shunts _____

When bought _____

From whom and where _____

Purchase price _____

Expenses _____

Storage _____

Cartage _____

Commission _____

Repairs, total _____

Selling price _____

Sold to _____

Rentals, total _____

Remarks _____

Checked by _____

Permanent Record of Motors Sold

the folder system is that all figuring necessary in the preparation of the bills has been made on the inside cover of the folder.

Testing

After a motor has been rebuilt and ready to be placed on sale it is given a thorough test. It is tested for three hours at its normal rated capacity and then for a half-hour receives a 50 per cent overload test to make sure of its ability to stand up.

Those motors which are passed are then given a shop number by which they are known thereafter. This number is stamped on a special name plate which is attached to the machine and contains in addition the motor's r. p. m., horsepower, phase, volts, wattage, in the case of generators; amperage and temperature rise.

The number thus given is transferred to a card, known as the "Motor Record," also shown here, which contains every possible piece of information concerning the machine. In this way a permanent record is kept of the "Venino-built" motors, and it is used also in the case of new machines which have been sold.

“Time and Material” “Cost Plus” Pricing and Billing Methods

MOST electrical contractors feel that they have really become established in business when a large part of their total volume can be secured on a non-competitive basis. Under this condition selling is on a service basis rather than on a price basis; selling efforts become to a great extent efforts to give service, which is after all the highest type of salesmanship; a large part of the expense of estimating is avoided, and finally there is the satisfaction of seeing your customers come back year after year because they like the way they have been treated.

Ignorance of business fundamentals on the part of many contractors has in too many localities resulted in educating the general public to believe that a mark-up of 15 or 20 percent on prime cost is an ample margin for the electrical contractor. In consequence it has become very difficult for the contractor to obtain a fair price and in many instances he has been forced to adopt policies which by no stretch of the imagination could be termed strictly honest.

The first step in the solution of any problem must be to obtain a thorough knowledge of all conditions. Believing that a knowledge of the existing practice in pricing and billing this class of work would be helpful to everyone and would greatly assist in the standardization of methods, THE ELECTRICIST has made an extensive study both in the field and by questionnaire of the more essential details of the subject.

The scope of this discussion is limited to that part of the contractor's business which is not taken at fixed and agreed-upon prices. Under this general division there are two distinct classes. First are open orders, commonly known as “time-and-material” work. In this class of business there is no agreement between the customer and the contractor, either verbal or

written, either as to the total price for the job or as to the basis on which the charge is to be made. “T. & M.” work is usually understood to include only small jobs, the great majority amounting to less than \$50, though occasionally a much larger job may be handled in this way. The second class includes those contracts which specifically state the basis on which the charge for the work is to be computed, more commonly either a percentage on the cost of labor and material or a fixed price for labor and a percentage on the cost of material.

Mark-Ups and Percentages

So much confusion exists over the application of percentages that the method used here should be clearly defined. The term “mark-up” is used as meaning the percentage that is added to the cost of labor or material or both, that is, to prime cost, not including overhead. All single mark-up percentages stated are percentages of prime cost.

When the mark-up is stated in the form of two percentages, as 25-20 percent or 40-10 percent, the method of applying the percentages is exactly the same in principle as the method of applying discounts which are stated in a similar manner.

The contractors to whom the questionnaire was sent were asked to state which ones of several methods they use in computing the selling price on T. & M. work, or open orders, and the mark-ups used with each method for small work and for large work. The terms “small” and “large” are somewhat indefinite, but the dividing line between “small” and “large” may probably be taken as somewhere between \$200 and \$500, while the upper limit to the class of business handled in this manner would ordinarily be around \$1,000. The average, maximum and minimum mark-up percentages used with three pricing methods are shown in Table 1.

Either method No. 1 or method No. 2 may of course be used in connection with method No. 3, or either of the two labor methods, Nos. 1 or 2, may be used with some other method of charging for material.

It is rather generally agreed by electrical contractors that a net profit of about 10 percent is fair and reasonable. It is accordingly very common practice to state mark-ups in the form of two percentages, the first figure representing the necessary charge for overhead, with the second figure for the 10 percent for net profit. For the purpose of making comparison with such two-

TABLE 1—TIME AND MATERIAL WORK—MARK-UP PERCENTAGES

Pricing Method	Average	Mark-up Percentage	
		Lowest	Highest
1—Labor at cost plus a percentage			
Small work	48 (35-10)	23 (12-10)	100 (82-10)
Large work	35 (23-10)	12 (1.8-10)	60 (45-10)
2—Labor at a fixed price per hour			
Small work	60 (45-10)	25 (14-10)	100 (82-10)
Large work	47 (34-10)	15 (4.5-10)	100 (82-10)
3—Material at cost plus percentage			
Small work	47 (34-10)	10 (0-10)	100 (82-10)
Large work	35 (23-10)	10 (0-10)	100 (82-10)

figure mark-ups, the equivalents of the single figures are given in parentheses in the above table, broken up into an overhead allowance and 10 percent as net.

The most interesting and valuable conclusion to be drawn from the data in Table 1 is the recognition by most contractors of the fact that small time and material jobs cannot be handled on less than about 50 percent mark-up, which is equivalent to 36-10 percent, irrespective of the pricing method.

The minimum figure of 23 percent on small jobs for method No. 1 would seem to be an error, more especially so because the same contractor applies a mark-up of 100 percent when using method No. 2. One man adds 25 percent to his labor cost on both small and large jobs, but compensates for this by a 100 percent mark-up on material.

The contractors reporting the minimum mark-up of 10 percent on material use the plan of including all their overhead in the charge for labor, so that the 10 percent represents clear net profit.

In studying the answers one is inclined to believe that the contractors reporting some of the high figures are somewhat over-optimistic and have reported the mark-ups they would like to get rather than those they actually do receive.

Pricing Methods

As between the two methods of pricing labor, method No. 2, i. e., selling labor at a fixed price per hour, is by all odds the most popular. Only 10 percent of those reporting prefer method No. 1, namely that of charging labor at cost plus a percentage, while over half prefer No. 2. About a third stated they have no preference. In this connection it should be noted that the average mark-up percentages for method No. 2 are considerably higher than those for method No. 1. The general class of business under discussion is that in which the customer does not ask for any statement of the basis on which the work will be charged. However, the method of pricing labor will in many cases be indicated on the invoice, and more often than not the customer is well informed as to the contractor's usual practice in this respect.

It has frequently been observed that the customer will accept without objection a higher charge for labor if billed at a flat price per hour than if billed

at cost plus a percentage. This is true even in localities where there is an established wage scale which is well known to the general public.

There are two general methods of charging for material on T. & M. work: Adding a percentage to the cost, and billing according to some established scale of resale prices. Of the firms replying to this part of the questionnaire 75 percent use the first named method and 25 percent use the second.

Under the general plan of billing material at cost plus a percentage the method of including all overhead in the labor charges has certain advantages, though the questionnaire reveals the fact that this idea has not come into widespread use.

Practice varies as to the uniformity of the percentage of mark-up on material. Nearly all contractors make use of a sliding scale of prices based on quantity, as indicated by the averages for "small work" and "large work" shown in Table 1. It is also a somewhat common practice to distinguish between standard articles supplied in bulk and the more or less special items usually sold in small quantities.

In order to apply these principles logically and consistently the contractor must be provided with a complete record covering prices for all materials and for all quantities of each item, and this record must at all times be kept up to date.

Of those reporting material pricing methods 21 percent use the Henderson-Hazel Price Service which provides such a record with all prices scientifically worked out.

Two contractors answered "No" to the question "Does the pricing method you use pay a fair net profit?" One of these uses mark-ups 28 percent below the average and the other is 5 percent below the average. One man who gets 100 percent on his labor and 87 percent on material on small jobs, and 55 percent on both labor and material on larger work very cautiously replied to this question "I think so." Virtually all others indicate that their net profit is satisfactory.

Billing

The form in which the bill is made out is considered by many successful contractors to have a decided bearing on the customer's state of mind. The item of office labor in billing is also

important. The following questions in regard to billing practice were therefore asked:

1. *Do you itemize all material and labor, showing the actual cost per unit of each item, extend each item, total the extensions, and then add a percentage to this total prime cost?* Nine percent of the replies indicate a preference for this method. In addition, one man uses this plan sometimes, one bills large work only in this way, and one follows this method only when the bill goes to the architect or general contractor.

2. *Do you itemize all material and labor, showing the selling price on each item?* This is the popular method, 65 percent of the answers giving this as their general practice. Three others bill small work only in this way, one jobs over \$25, one sometimes, and one bills labor only according to this method.

3. *Do you list all items of material and labor, but without any itemized prices, showing on the bill either the total selling price only, or two lump sum prices, one for labor and one for material?* Seven percent follow this method as a general practice and two more use it occasionally.

4. *Do you state the selling price for the labor and the selling price for the material and the total, without any itemizing?* This is the least popular method, being given a preference in only 5 percent of the replies. Four more sometimes use this method; two itemize the labor, but state the charge for material only in a lump sum; one itemizes the material but not the labor.

5. *Do you state only the total charge without any itemizing?* Nine percent use this method as their regular practice. One sometimes bills in this way, one uses this plan for bills under \$5 and one for bills under \$25.

The percentage of bills on which some complaint is received from the customer runs all the way from practically 0 to 25 percent with one contractor reporting as high as 40 percent. These figures are of course only approximate, and prove nothing except that most of those who replied to the questionnaire are fairly well satisfied with their own methods.

The final question on open orders was "Why do you consider your methods the best?" All of the replies are instructive. A few are given below.

One man very frankly answers "I

don't." Another states that he is not satisfied with his own methods and would like something better.

One user of the first billing method says: "The public is not unreasonable and realizes that you must add your overhead. Have such an understanding before you start work."

The following comments come from contractors who use billing method No. 2 (itemizing at selling prices):

"Most of our customers are fair minded and willing to pay us a reasonable profit, and by itemizing the bill they believe we are not trying to cover anything up."

"Because I have no complaints and am making money, also new customers."

"The customer can check the work, compare our prices with those of other contractors, and knows what he is getting and what he is paying for each item."

From one man who uses billing method No. 3, itemizing quantities and hours, but with lump sum selling prices: "Experience shows a fair profit and a minimum of complaints."

From another who uses methods Nos.

3 and 4: "We have tried them and find the public is well satisfied and there is less work for our office. Over a period of four months we have had only one request for an itemized billing."

Referring to billing method No. 4 (no itemizing). "We have used this method for years and the results are reflected in the number of complaints we receive. (1 percent.)"

One man who bills material in a lump sum but itemizes the labor says: "We have had less complaints since we have been billing this way."

Four contractors who simply state the total charge in one lump sum with no itemizing comment as follows:

"There is less argument than where the bill is itemized."

"Because it has worked most satisfactorily."

"Nine times out of ten the customer is concerned with total cost only. To the average customer an itemized bill is confusing at best and is the cause of lots of argument. If your billing price is consistent with the work performed, the average customer will never complain. Any man of experience has a sense

of proportion, but most contractors do not realize this."

"As a rule itemizing does not mean anything to the customer. Get his confidence and he cares nothing about an itemized statement."

Three of the contractors who use the Henderson-Hazel Price Service summarize their experience as follows:

"Because we believe that these prices are fair both ways."

"Consider this method the best because it could be standardized more readily and thereby become more satisfactory."

"Best plan I have found, both as to fair price and saving of time."

The somewhat conflicting testimony presented here as to the value of the various billing methods does not lead to any very definite conclusions. Method No. 1, itemizing everything and showing unit costs and then adding mark-up, has no great following. No. 2, itemizing with unit selling prices, seems to have the best of the argument. However, a respectable percentage of contractors are using Nos. 4 and 5, which are essentially the same (no itemizing

The image displays nine different electrical work order forms, each with its own header and layout. The forms are numbered 1 through 9, corresponding to the figures mentioned in the caption. They include fields for customer name, address, job description, and pricing. Some forms have checkboxes for 'Standard Electric Machine Works' or 'Standard Work Order Form'.

- Form 1:** BYCK ELECTRIC CO. INC. WORK ORDER. Includes fields for job number, date, and a table for itemized charges.
- Form 2:** AUTHORIZED ORDER. To HARRY M. BINDER, 1819 1/2 HARNEY STREET, OMAHA. Includes a section for 'Describe Work'.
- Form 3:** GOLDEN STATE ELECTRIC CO. INC. Includes a section for 'REMARKS OF AGREEMENT'.
- Form 4:** DENTON ENGINEERING AND CONSTRUCTION CO. Includes a section for 'PRICES' and 'TERMS'.
- Form 5:** DAILY WORK ORDER. YOUNG ELECTRIC WORKS. Includes a section for 'Description'.
- Form 6:** Standard Electric Machine Works. EXTRA ORDER. Includes a section for 'To Standard Electric Machine Works'.
- Form 7:** Fred E. Geiss Electric Company. Includes a section for 'Description of Work'.
- Form 8:** MILWAUKEE ELECTRICAL CONTRACTOR DEALERS ASSN. Includes a section for 'You are hereby instructed to do the following electrical work'.
- Form 9:** THE CAREY-BECKMAN CO. Includes a section for 'Please do the following work and charge to my account'.

Figs. 1, 5 and 7 Are Approval Cards; the Others Are Order Forms

[illegible][illegible][illegible][illegible][illegible][illegible]

TIME CARD

NAME: _____ DATE: _____

EMPLOYEE: _____

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99. MONITOR: _____

100. MONITOR: _____

[illegible]

at all). No. 3 is an intermediate step in the same direction and is used to some extent.

Complete itemizing of all bills is quite an expense to the contractor which must be passed on to the customer through the overhead charge. In the case of the smaller bills at least, say up to \$25 or maybe \$50, what real value has an itemized bill to the customer?

The customer is certainly entitled to an itemized bill if he wants it, but unless he already thoroughly understands the basis for the contractor's prices it is much safer for the contractor to present the itemized statement personally after it has been requested, which gives him an opportunity to show that his price is fair and equitable. A very successful contractor in Baltimore renders only lump sum bills even for work amounting to as much as \$1,000. If called on for an itemized statement he takes his original job cost record to the customer and shows him that he has applied a mark-up of 50 percent, which he can justify as entirely fair and reasonable when he has the opportunity to present the case personally.

It is certain that the more common practice today is to itemize, but it is equally as certain that many contractors have found that customer relations are improved and unnecessary expense is eliminated by not itemizing. If the experience of some contractors shows the latter practice to be the best for them, why is it not the best for all, except of course under some special conditions?

Contracts and orders which contain a definite stipulation as to the basis on which the charges shall be rendered form the second principal class of non-fixed-price business. Such orders may be either written or verbal and jobs handled in this manner range in size from the smallest to the largest. Practically every form of contract used for this class of business is covered under the following classification:

1. *Cost plus a fixed fee.*
2. *Cost plus an agreed percentage.*
3. *Labor at a fixed price per hour.*
4. *Material at cost plus percentage.*
5. *Material at some definite scale of prices.*

It is evident from the replies received that fixed fee contracts are little known and little used in the electrical contracting field. In the most simple form of

such a contract the contractor receives the actual cost of labor and material plus a fixed sum of money representing his overhead and profit on the job. The cost is presumably predetermined approximately by the contractor, but whatever the actual cost may be the fee is not changed. Cost-plus-a-fixed-fee is the most vicious plan known in the contracting field when the owner asks several contractors for bids, leaving the fee to be determined by competition.

Under the second plan, cost plus a percentage, the percentage of mark-up is usually the same on both labor and material.

Plan No. 3, labor at a fixed hourly rate, is used in combination with either No. 4 or No. 5.

Five contractors stated a preference for the fixed fee plan, though there is reason to doubt whether all of them understand just what this form of contract is. Plan No. 2 is given the preference in 34 percent of the replies. The combination of No. 3 and No. 4 is a close second with a score of 30 percent, while a combination of No. 3 and No. 5 is also used quite extensively, 20 percent preferring this method. Five or six of those replying do not like any cost plus scheme at all, preferring rather to work on a flat contract price.

Of those firms which use the No. 3-No. 5 combination, that is, a price per hour for labor with material priced according to a definite price list, several use the Henderson-Hazel material prices, and a number of the Pacific Coast contractors use a price list published locally.

Mark-Ups

The averages of the mark-up percentages used under plans 2, 3 and 4 are shown in Table 2. As in Table 1, the equivalent two-figure percentage is also given, also the highest and lower figures reported.

The minimum figure of 10 percent as a mark-up on material is reported by contractors who use the overhead-on-labor plan, so that the 10 percent on material is net profit.

In these figures we again find evidence that labor can be sold for more money at fixed hourly rates than at a stated percentage of mark-up. Comparing the averages in Table 2 for plans 2 and 4 it will be seen that the mark-ups are practically identical. That is, under plan 2 where one percentage is applied to the total cost of labor and

material the mark-ups are the same as those applied to material only under plan 4. But when labor is billed at a fixed price per hour in combination with material at cost plus a percentage the prices received for labor are considerably higher than under plan No. 2.

The average prices in Table 2 were checked by the "Scale for Computing Overhead" published in the June, 1925, issue of THE ELECTRICIST. This scale takes into account the actual overhead expense of the individual contractor.

Mark-Ups Low

It was apparent that the mark-ups in general use under the "cost plus percentage" plan are too low for any but the most efficiently operated businesses. The variation in overhead between jobs of various sizes appears to be about right.

Combining the averages for plan 3 and plan 4 on the assumption that the labor cost is equal to the material cost the averages are those for a business having an average overhead which is about normal; in other words they are approximately right for the average contractor. The averages in the table are much lower for the smallest jobs and somewhat higher for jobs above \$2,000. This is probably due to the fact that in many cases it is not found expedient to charge against the small job as high an overhead as the facts would justify, the shortage here being made up by increasing the percentage applied to the large jobs.

No very convincing arguments were brought out by the request to state the advantages of the particular form of contract preferred.

One contractor who evidently is familiar with the cost-plus-fixed-fee form of contract states that he prefers this form because there is less chance for dispute with a client.

Some users of the straight cost-plus-percentage plan give the following reasons for preferring this method:

"Variations in the cost of labor and material or unusual expenses do not affect the percentage of earning."

"We know just what our profit is going to be."

"We get a percentage on the total cost of the job, regardless of whether most of the cost is made up of labor or material."

"It is absolutely fair to the customer, eliminates loss to us and involves less bookkeeping."

The following are some of the arguments advanced in favor of the plan of

charging a fixed price per hour for labor and a percentage on material:

"We can sell the general public a fixed price, but it is hard to sell the idea of overhead expense."

"Our price per hour includes overhead but no profit. Net profit at these rates must come from material and here we are handicapped because the average industrial can secure the same prices (or better) on material as we do. (This contractor applies a mark-up of \$1.03 per hour on labor.)"

the very large industrial plants. Motors and much other apparatus which cannot be sold at as high a mark-up as other material under the plan have all overhead covered in the labor charge so that the percentage obtained on material is net profit. This method has not yet been given a sufficiently extensive trial to demonstrate its comparative value, but it undoubtedly has some

materials and labor and hiring the contractor to superintend the installation or else of actually checking all invoices and time slips. The conditions existing in many localities are very well illustrated by the following statement made by a New Jersey contractor:

Adjusting Cost

"I get a mark-up on small work of approximately 50 percent. I have been in business for a number of years and I know from experience that I cannot make any money at any lower prices. But I have one competitor who takes work at 12-6 percent on cost, and when I am in competition with him I also offer to do the work at 12-6 percent on cost. In such a case, however, I still get my 50 percent by adjusting the 'cost.' I do not like to do this, but what else can I do? I must get business and would lose heavily on any job marked up 12-6 percent.

Another contractor takes small jobs on an agreed price basis of 20-10 percent on prime cost, which is much better than 12-6 percent, but he states that this mark-up pays a fair net profit "if you are careful of the cost."

In another city for many years the maximum mark-up obtainable by an honest contractor on large work was 15 percent of prime cost when the contract was on the "cost plus" basis. This was due solely to the fact that certain contractors who stood ready to take on any and every contract at "cost plus 15 percent," the term "cost" meaning whatever the traffic would bear.

Office Methods

Signed Orders for Small Jobs

The great majority of the small orders received by the contractor are received verbally or over the telephone. There are two methods in more or less common use for securing some sort of written confirmation of such an order. The most used method is to fill out an order on the spot and present it to the customer for signature, or, in the case of a telephone order, to instruct the workman to secure the customer's signature before doing the work.

The other plan is to give the workman a card on which the work is described, and instruct him to enter the time worked on this card and secure the customer's signature as approving the work and the time recorded.

Many contractors feel that it is poor business to proceed with any work with-

TABLE 2—MARKUP PERCENTAGES

Form of Contract	Estimated Prime Cost of Job					
	0 to \$100	\$100 to \$500	\$ 500 to \$2,000	\$ 2,000 to \$10,000	\$10,000 to \$25,000	over \$25,000
1—Cost plus a fixed fee	(Insufficient data)					
2—Cost plus percentage						
Average	45 (32-10)	37 (24-10)	32 (20-10)	27 (16-10)	22 (11-10)	21 (10-10)
Lowest	32 (20-10)	30 (18-10)	20 (9-10)	10 (0-10)	20 (9-10)	20 (9-10)
Highest	67 (52-10)	54 (40-10)	50 (36-10)	38 (25-10)	27 (15-10)	21 (10-10)
3—Labor at fixed hourly rate						
Average	56 (42-10)	52 (38-10)	48 (35-10)	46 (33-10)		
Lowest	33 (21-10)	25 (14-10)	25 (14-10)	25 (14-10)		
Highest	76 (60-10)	72 (56-10)	72 (56-10)	60 (45-10)		
4—Materials at cost plus percentage						
Average	46 (33-10)	36 (23-10)	32 (20-10)	30 (18-10)	24 (13-10)	
Lowest	10 (0-10)	10 (0-10)	10 (0-10)	25 (14-10)	20 (9-10)	
Highest	100 (82-10)	80 (64-10)	50 (36-10)	40 (27-10)	30 (18-10)	

"Everything is definitely known and there can be no misunderstanding as to the agreed percentage."

"There is no argument over the bill."

"Remuneration is based on size of job only."

There are several arguments in favor of the overhead-on-labor plan. This is a special case of the method of charging a fixed rate for labor and a percentage on material. Under this plan a record is kept (preferably) of the total hours of labor per year and the total overhead expense for the year in dollars is divided by the total hours, giving the overhead in dollars per hour. The overhead charge will commonly range from 60 cents to \$1.00 per hour. The labor cost is then considered to be the wages paid plus the overhead cost. To this total labor cost, plus the cost of material, a percentage is added for profit, usually 10 percent.

A number of contractors who have tried this method have found that the overhead charge appears small to a man who has any knowledge of manufacturing overheads. Material at actual cost plus 10 percent is somewhere near the prices which would be paid by any but

advantages and should at least be given consideration.

The whole problem is a selling problem. The general public while agreeing with the abstract proposition that every man is entitled to a fair price for his services can with difficulty as a rule be persuaded to apply this principle to the extent of paying one man a higher price than is asked by a competitor.

Referring once more to Table 2, there are very few contractors who would not be well satisfied with mark-ups of 33-10 percent on labor and 18-10 percent on material on jobs ranging in cost from \$2,000 to \$10,000. There is no question but that such prices are commonly obtained in some cities. There is also no question but that in other localities there is no possibility of obtaining any considerable amount of business on any such price basis.

Where there is unhealthy competition on "cost plus" work a contractor's conscience and not his books are his only guide as to what constitutes "cost." This condition has given rise to the growing practice on the part of architects and builders of buying the mate-

out a signed order. However, the replies to a question on this detail show that only 25 percent make a regular practice of securing the signed order before doing the work, 6 percent use only the card which is signed by the customer after the work is done, and 69 percent do not use either plan. Several of those who ask for the signed order also get the customer's signature on the approval card.

Orders

The order is a convenient and business-like record for both parties and there are few customers, if any, who will object to signing it, though it possibly may not be a necessity for the contractor doing a small business which is almost entirely confined to customers already on his books. One contractor who does not ask for signed orders says: "I see the customer personally after every call." Many of those who do not make it an invariable rule to secure a signed order do ask for it when the customer is a new one or not personally known, or as one man puts it, "When we think it is necessary." This means that every order received must be given immediate attention by an executive, which is an impossibility in a large organization. Securing the signed order must be a matter of regular routine in the large company if it is done at all.

Several samples of order forms and approval slips are shown on page 49. With one exception these are all of small size so that they can conveniently be carried in the pocket. The one large form is made out in triplicate in the office and two copies are mailed to the customer so that he may sign and return one copy and retain the other. The smaller forms are almost invariably made up in book form and are about 4½ in. by 6 in.

One of these orders when signed becomes a contract and hence the wording is important. After the name of the contractor to whom the order is addressed and the date the order should read "Please proceed with the following work" or "You are hereby authorized to do the following work." A definite space should be provided for the street and number or other description of the premises where the work is to be done and another space for stating the basis on which the work is to be paid for. One contractor uses a form hav-

ing the wording "for which we agree to pay the sum of \$———" and "on time and material basis," one or the other of these alternates being crossed off when the order is made out. Another good form reads "We charge for a journeyman workman's time at the rate of —— per hour and for a helper's time at the rate of —— per hour. All material will be invoiced at our regular selling price."

These orders should always be made up in triplicate so that the customer and contractor may each have a copy, and a third copy can be left in the book to be referred to in case the original should be lost. It is a very good plan to have these forms machine-numbered by the printer. It is also very important to leave a blank space in one corner for the job or work order number so that the customer's order corresponding to a certain work order may be readily identified.

Approval Card

The approval card is also in effect a contract, though it is not signed until after the work is done, and the general requirements for such forms are much the same as for the order blank, except that space must be provided in which the workman can enter his time. Just above the space for the customer's signature the following wording or equivalent should appear: "The above work has been completed in a satisfactory manner and the time as stated above is approved."

On a large contract handled on any "cost plus" basis the customer usually wants to have some means of checking the quantities of material and hours of labor billed to him. The questions were therefore asked, "Do you secure the customer's receipt for material?" "How is this done?" "How is the customer enabled to check the workmen's time?"

About one-third of those replying to these questions send a duplicate list of material with every shipment to the job. The original is signed by an authorized representative of the customer and is retained by the contractor as a receipt, the duplicate copy being left with the customer. A somewhat larger proportion provide the customer with some means of checking the billing for labor. In some cases the contractor's men register their time by using the customer's time clock, but the more common

method is to require the workman to make out daily time cards in duplicate, one copy being given to the customer.

These methods are of course applied only on the larger class of work.

In addition to the allowance for general overhead expense included in the mark-up in a "cost plus" contract, a charge is sometimes made for engineering and drafting and for supervision. In this case again the practice of making such charges is limited to the larger work. It is somewhat surprising to find that 17 percent state that they do make a separate charge for engineering and drafting and 31 percent make a separate charge for supervision. When these charges are made the more general practice is to include the actual cost as a part of the labor cost, so that the mark-up is the same as that applied to the direct labor on the job.

Job Costing

To find the cost of a job there must be three original records: (1) Material going to the job, (2) material returned from the job, (3) labor. From these records the net cost of the material and the cost of labor are computed, then the sum of these amounts plus any other charges such as permit fee and carfare is the total prime cost.

One of the most widely used methods for finding job costs is the Job Envelope System. In its most simple form as applied on small work this system requires four printed forms as follows:

Material Requisition Sheet
Material Credit Sheet
Daily Time Card
Job Envelope.

A requisition sheet or material charge sheet is filled out for each lot of material going to the job, whether from the contractor's own stock or ordered from a jobber. The heading of this form should show the date and requisition number, the address to which the material is to be delivered, whether the material is to be taken from stock or purchased from a jobber, and the name or initials of the individual who made out the requisition. Either in the heading or at the bottom of the sheet there should be a space for the signature of the person who receives the goods. These are the essentials; various other items are included by different contractors to meet the requirements of their own routine methods.

Four columns are required in the

body of the form for entering the quantity, description of the material, unit cost and cost extension. If the contractor makes a practice of billing work on some fixed price schedule, i. e., not on a "cost plus" basis it is well to add two more columns for unit selling prices and selling price extensions.

The largest size of sheet that is practical for use with an $8\frac{3}{4}$ in. x $11\frac{3}{8}$ in. envelope is 8 in. x $10\frac{1}{2}$ in. The size selected for requisition sheets should depend upon the number of items to be included in the heading, the number of columns in the body of the sheet, and the number of material items to be entered. A good size which would answer almost any requirements would be 8 in. long by 7 in. high. This would leave a liberal heading space and provide about 15 lines for material items. These forms are commonly made in duplicate so that one copy can be sent to the job as a shipping memorandum for receipt by the job foreman or the customer, or in some cases triplicate forms may be desirable.

All the above statements in regard to requisition sheets apply equally as well to the material credit sheets. Different colors should of course be used for the credit sheets so that they may be easily distinguished from the requisitions.

Time Card

A time card is made out by each workman for each day. Beside the date and workman's name the essentials here are columns for job number, name of job, hours worked and expense, such as carfare or telephone calls. A number of such sheets provide columns for entering the time starting and stopping work, which is a good idea. Space is often included also for a few words describing the nature of the work done. Some of the samples received have columns for entering the wage rate and cost to be charged to each job; these are of doubtful utility. Some of the larger companies require all time cards to be approved by the job foreman and the superintendent and appropriate blank spaces are provided for this.

Time cards are often subjected to rather rough handling and should be printed on fairly strong paper, though this may be a cheap grade.

The job envelope is in effect a card record of the essential data pertaining to the job, and at the same time serves as a container for the material charges

and credits and other papers. A standard form is the A. E. I. envelope illustrated on page 50. This measures $8\frac{3}{4}$ in. by $11\frac{3}{8}$ in. Envelopes of this size are accommodated nicely by a standard letter file cabinet. Smaller sizes are slightly cheaper, but require special file drawers which are more expensive, and if much smaller will not hold some papers except when folded and there is not sufficient space on the face of the envelope.

For small jobs each material requisition is priced, extended and totaled and the requisition number and total cost are entered on the face of the envelope. Material credits are handled in the same way except that entries on the envelope are made in red ink. The total of the credits is then deducted from the total of the charges. An entry to the envelope is also made from each time card, showing the date, workman's name and wages paid chargeable to this job. Job expense items are entered in the column with that heading.

On Larger Jobs

For larger jobs there is insufficient space on the envelope for entering the labor charge from each time card and an additional form is required, such as the Labor Summary Sheet shown on page 50. This sheet needs to be as large as can be conveniently handled. The form illustrated is 8 in. by $10\frac{1}{2}$ in. The name of each workman and the hours he works each day are entered to this sheet from the daily time cards. The total cost of labor for one month is computed on this form and this amount is entered on the envelope.

When there are several shipments of the same kind of material to a job during one month some contractors prefer to use a Material Summary Sheet on which the various quantities may be consolidated into one total, and the credits deducted, leaving the net quantity used. The net quantities are then priced and extended and the total net cost for the month is entered on the envelope. If a form of this kind is not used on all large jobs the total charge for material for one month is computed from the requisitions and this sum is entered on the envelope, likewise the total credit for material returned. As in the case of the labor summary as much space is needed for the material summary as can be obtained, and for the size of envelope recommended the

form should be 8 in. by $10\frac{1}{2}$ in. A well designed form of this kind is included in the group of A. E. I. forms on page 50.

Contractors handling large work generally prefer to keep their cost records in loose leaf binders rather than in envelopes. The system and the forms are in all essential features the same as those just described. The material requisitions and credit sheets and the material and labor summary sheets should in this case all be the same size. A very practical size for such loose leaf forms is the standard letter size, $8\frac{1}{2}$ in. by 11 in.

Job Sheet

The Job Sheet provides a very economical and efficient method of costing small jobs. This one form takes the place of all the forms used in the envelope system except the time card.

This form as most commonly used has a printed list of all the more common material items with blank spaces for special material. At least three columns should be provided for quantities sent to the job, one for the material returned and one for the net quantities used, with final columns for the unit costs and extensions. In order to be complete and so most useful proper spaces should be provided for entering the labor hours and costs and expense items and for a summary showing the total prime cost of the job and gross profit.

When designed by a contractor for his own use on one special class of work such as house wiring it is possible with some crowding to include all the necessary material items on one side of an $8\frac{1}{2}$ in. by 11 in. sheet. The other side must be used for the other data. In order to provide space for more items and so make the form more generally useful, the A. E. I. job sheet shown on page 50 is a folded sheet with working space on three pages. In order to take full advantage of the economy of this system, the active job sheets should be kept in the stockroom and all material charged or credited to the job should be entered directly on this form without first listing the items on some other piece of paper.

Almost all of the contractors who replied to questions in regard to cost records either use the A. E. I. forms or use very similar forms of their own design.

Chats on the National Electrical Code

*A Monthly Discussion of Wiring Practice and Questions of Interpretation,
Presented with a View Toward Encouraging a Better Understanding of the In-
dustry's Most Important Set of Rules*

Conducted by F. N. M. SQUIRES
Assistant Chief Inspector, N. Y. Board of Fire Underwriters

Conductors for Gas Filled Lamps

The present rule 1503, that prohibits the use of any gas-filled lamps on rubber covered fixture wire, has been reworded in the 1927 tentative revision to cover only mercury vapor lamps. Two new rules are added, as follows:

1504—Incandescent Lamps.

a. Incandescent lamps shall not be equipped with medium bases if above 250 watts rating, nor with mogul bases if above 1500 watts. Above 1500 watts special approved bases or other devices shall be used.

b. Gas filled incandescent lamps shall not be located in show windows nor where liable to contact with inflammable material, unless installed in approved fixtures equipped with shades or guards, or suitably designed to operate at a safe temperature.

1505—Wiring to Lamps.

Wires connected to lamps shall have approved insulating coverings with heat resisting qualities consistent with the temperature to be encountered. (See Article 6 of this Code.)

(The rule referred to under Article 6, is 604 (a) which requires slow burning or asbestos covered fixture wire when the temperature exceeds 120 degrees F.)

We have the temperature of every individual lamp in a building to contend with in making our inspections, and it is practically impossible to make such a temperature test to determine whether the temperature of a socket exceeds 120 deg. F. We, therefore, recommend that only approved asbestos covered flexible cords with a braid over each conductor be used on all drops inside buildings in dry places. In damp places asbestos covered flexible cords will not be approved nor will other than rubber insulation be acceptable on outdoor fixtures.

Strange to say, with all of our preaching on this subject, not one supply house in New Orleans that we called up had a stock of asbestos covered drop cord in stock on May 26, 1927. Some of them promised to get a supply, and others stated "they did not handle the material."

Asbestos covered flexible cord makes a safer installation than rubber covered cord. The braid on rubber covered cord

is supposed to be so treated that it will not carry flame, and we can say that all braid tested by us in the past is so treated, (it is not exactly flame proof) but the rubber insulation burns very freely. With asbestos covered cord the flaming will not be as great, which is one advantage from a fire hazard viewpoint.

Flexible cord is frequently destroyed from short circuits, especially when fuses are bridged. The destruction of the cord prevents the other wiring from overheating and we think that No. 18 gauge cord and fixture wire is a somewhat reliable form of incidental protection, taking into consideration the present type of cutouts that can be so readily bridged with coins. When a short circuit occurs with bridged fuses, the cord melts and opens the circuit and if it will not flame, the result from the fusing or heating of the small copper conductor will not be as hazardous with asbestos covering as it would be with rubber covered cord.

Incidentally, when the temperature exceeds 120 deg. F., the socket also should be guaranteed by the manufacturer to stand the heating.

George Wellman.

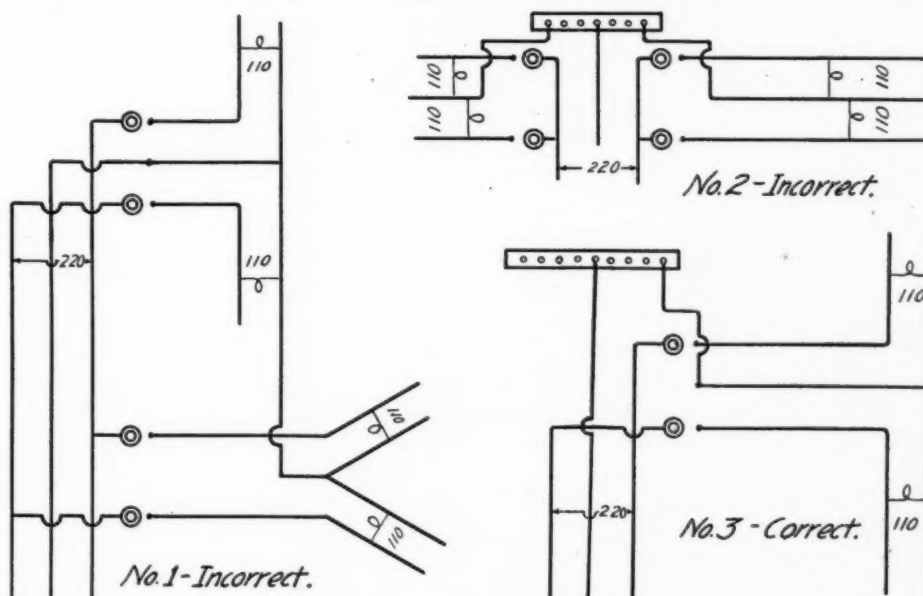
Center of Distribution of 3-Wire Circuits

The Interpretations Committee of the Electrical Committee of the N. F. P. A. has released its findings on the question:

What is a "center of distribution" as referred to in paragraph (e) of Section 807?

Answer: The point where the 3 wires constituting a 3-wire branch circuit are connected in accordance with the provision of the Code to the wires which supply them.

The intent of the restriction "neutrals shall not be interconnected except, etc." is to prohibit deriving a 3-wire branch circuit from a circuit consisting of the two outer wires of a 3-wire system run for some distance from a center of distribution and then joined



These three diagrams show two incorrect methods and the correct method of wiring three-wire branch circuits from d. c. or single phase a. c. systems having a grounded neutral

by the grounded neutral wire of a separate branch circuit to accomplish for the remaining portion of the original 2-wire circuit the equivalent of a 3-wire circuit with grounded neutral.

This matter was dealt with in the Code Chats of February, 1927, but we are bringing it up again in view of the recent interpretation and because there have been so many inquiries as to why diagram No. 2 in the February Chats was incorrect. Diagram No. 1 shows an incorrect method of connection inasmuch as the neutral wire for circuit A is supplied from the neutral of a separate branch circuit B instead of being connected to the neutral main at the point where circuit A receives its supply. (See interpretative answer on previous page.)

Diagram No. 2 shows an incorrect connection inasmuch as the two outside wires of either circuit A or circuit B are of the same polarity. That is, on circuit B there is a difference of potential between the neutral and either outside wire of 110 volts, but between the two outside wires themselves there is no difference of potential. Therefore, it is not a true 3-wire circuit.

[The full text of this and all of the other interpretations will be found on page 63 of this issue.—EDITOR.]

Abuse of Flexible Cord

Section 613-b provides that flexible cord shall be used only for pendants, wiring of fixtures, portable lamps or motors, portable heating apparatus or other portable devices. In other words, while admitting that flexible cord is a very undesirable material from a fire hazard standpoint, the Code grants that it is a necessary material and that its use, subject to certain restrictions, must be sanctioned. Flexible cord appears to be the only practical wiring material so far available and suitable for the purpose of maintaining the connection between a portable (movable) device, and the source of current supply. The popularity and utility of many electrical appliances can be attributed primarily to their portability, to their convenience when it is necessary to move them from place to place. The electric iron, portable heater, and small motor driven appliance, stand lamp, etc., owe their utility to the ease with which they can be moved about, and the use of flexible cord for such appliances is not in any way contrary to Code rule 612-b.

With the possible exception of the table or stand lamp, portable appliances are (or at least should be) disconnected from the source of supply when their period of temporary service is over. There are, however, many appliances coming on the market which are more or less permanently fixed in position—take for example the domestic electric refrigerator—its successful operation is dependent upon continuous (24 hour) connection with the circuit and portability is in no way essential to its utility or effectiveness of operation. Yet these machines are being supplied to the trade with attached cords varying in length from six to ten feet and apparently with the approval of Underwriters' Laboratories. Appliances of this character which come equipped with attachment cords surely invite violation of Code rule 611-r which states that twin wires shall be used only in conduits or where *flexible conductors are necessary*. It requires some stretch of the imagination to believe that a six to ten foot flexible cord is necessary for the connection of any appliance which by established practice or condition of use is neither capable nor convenient of being readily moved.

The convenience, ease and cheapness with which cord can be connected up and strung about the premises make it particularly susceptible to abuse, and every appliance which is *unnecessarily* equipped with an attachment plug and cord extension tends to reduce the factor of safety of the wiring in the building by encouraging the substitution of cord extensions in place of standard wiring.

Section 612-b attempts to regulate the use of flexible cords by stating where they may be used but *uniform enforcement* of this rule is dependent upon *uniform interpretation* of the term "portable appliance."

Section 611-r attempts to control the flexible cord hazard by prohibiting the use of twin conductors except when installed in conduit or where flexible conductors are necessary, but *uniform enforcement* of this rule is dependent upon *uniform interpretation* of the phrase "where flexible conductors are necessary."

Surely here is a rule which demands uniform national enforcement through uniform national interpretation. If the use of the cord connection cannot be restricted to portable (necessarily movable) appliances—if we must continue to use the cord connection for semi-

portable or permanently placed appliances, then would it not be reasonable to definitely restrict the length of such connection by requiring standard wiring to an outlet closely adjacent to the appliance?

Certainly confusion and non-uniform enforcement of Code rules invariably follow where Code treatment is indefinite or inadequate. The electrical industry in general and inspectors in particular would welcome a clear and definite treatment of this subject in the National Electrical Code—one that can be uniformly interpreted and enforced everywhere.

L. W. Going.

Hollow Tile or Concrete Block Walls

Regardless of whether hollow tile, concrete block or what type of masonry is used in a wall, unless it is absolutely non-hydrosopic, the dead space within the wall will be more or less damp, musty, etc. This space on hot days contains heated moist air, and on cold days contains an air that is moist and dead. Consequently we class such spaces as damp. The same process is continually at work between furring and the plaster finish on the inside of masonry walls, so we also class such spaces as damp.

Electrical work in such spaces will be considered as subject to moisture, and ordinary armored cable or flexible tubing will not be approved if installed in hollow masonry walls or between the furring and the walls.

On the other hand, armored cable on the exposed surface of the walls will not be considered as subject to moisture, because cable so exposed is not continuously exposed to dampness. Moisture may condense on such walls, but it soon dries off and does not materially affect the cable or armor. If the wall shows a continuously damp condition, cable will not be approved even on the outside surface of it.

George Wellman.

Raceway Bushings

Special attention is called to the use of the raceway bushings, which are required by the National Electrical Code, (See Rule 504-d). Electricians are inclined to omit the use of bushings on metal raceway construction, which is one of the more common defects listed by our inspector.

George Wellman.

Estimating Methods---III

By ARTHUR L. ABBOTT

Technical Director, Association of Electragists, International

EXTRAS and changes occur on almost all large jobs, and on this account it is rather the exception than the rule that any final figures are compiled which can be directly compared with the estimated costs and quantities. If all extras and changes have been carefully estimated a debit and credit statement can be made up which will show the total estimated costs of labor and material, and in the same way the estimated quantities of such items as conduit and wire can be found.

The total estimated cost of material should be compared with the total actual cost, then if any great discrepancy is found it should be traced down to the particular items where it occurred.

While there is satisfaction in discovering that the total estimated labor agrees closely with the actual labor, it should always be remembered that in itself such agreement proves very little. Serious errors may have been made on some of the operations, a loss on one being balanced by a gain on some other. The labor cost data which has checked out well with the total labor on one installation will probably give equally as good results on another similar installation, but may prove to be quite inaccurate when applied to a job which is different in certain respects.

Special cost records which show the labor hours and cost on each class of work separately can be of very great value to the contractor if the records are properly kept and properly used.

Much valuable data may be secured by occasionally keeping a very simple record of some one particular part of the work on a job. For example, on the larger jobs there is usually a certain period when there is scarcely any work going on except roughing in the branch circuit work in the floors. It is very little trouble to record the total labor on one or two or a half dozen floors. Also the labor for installing a certain run of large conduit, pulling in a certain run of large wire, or any one of a number of other operations can be easily recorded.

The most satisfactory plan, however, is to keep a complete itemized labor

record of all the work on a job. This of course is something of an undertaking and involves some expense. As an offset to this expense the keeping of such records is the best kind of training for an estimator; the data secured is of much value to the individual contractor and can be made ten-fold more valuable by exchanging with other firms through the A. E. I.

Actual vs. Estimated Costs

By carrying the record system a little further and making weekly comparisons between actual costs and estimated costs during the progress of a job it is reasonable to believe that the money spent in operating the system can be made to return an actual net profit, that is, the records will point the way to improved methods of job management which may result in a saving in labor cost.

To set up and operate an efficient labor record system is not a simple matter, and when a contractor contemplates installing such a system it will always pay him to secure expert advice. By doing so immediate results can be assured and much costly experimenting can be avoided.

Printed forms are in themselves merely a part of the estimator's tools, and a set of the best forms does not constitute an estimating system; a competent estimator could do good work without suitable forms (though he never would undertake to do so), but he does better work and saves much time by using such forms. The time-honored principle of having a place for everything and keeping everything in its place is the fundamental idea applied in the use of suitable forms for estimating, or for that matter, in the use of suitable forms for any other purpose.

The work of making an estimate of any kind of construction work is naturally divided into four operations.

1. Taking off the quantities of material and setting them down on paper.
2. Totaling the quantities and adding any necessary allowance.
3. Setting down in order all the items of material so that the unit prices may be entered and extensions made,

labor units may be entered and multiplied by the quantities, and the columns of extensions may be footed.

4. Totaling the material and labor costs, adding certain other items of job cost, and finally adding overhead and profit to arrive at the bid price.

Five forms specially designed for the purpose and which are published by the Association of Electragists, International, are recommended for general use. These forms have been shown in this magazine a number of times and their use will be illustrated in later installments of this series. No. 1 is used for entering the branch circuit quantities as they are taken off the plans, and these quantities are also totaled on this sheet. No. 2 is for entering quantities of large conduit and wire, and No. 3 is a separate form for totaling these items. Either No. 2 or No. 3 may be used for entering and totaling quantities of any other material. The principle to be followed is to set down all preliminary figures in a systematic manner so that they become a part of the permanent records. By so doing the estimator can work more rapidly, he makes much fewer errors and he or anyone else can readily re-check any part of the work.

Form No. 4, known as the Pricing Sheet, has the usual columns for the material items, material quantities, unit prices and extensions and for labor units and labor extensions. No. 5 is a recapitulation sheet on which the total costs of labor, material and job expense are worked out and the final selling price is computed.

An additional form, designed several years ago by the Chicago Electrical Estimators' Association, has been found quite useful on work of the larger class. This is a "specification checking sheet" having blank spaces for entering all general data such as name and location of the building, names and addresses of the owner, architect and engineer, date for bids, etc.; also a list of all the principal items usually covered by the specifications with blanks for reference to specification pages and brief notes indicating the requirements as to each item.

(Continued in September Issue)

The Electragist

Official Journal of the
Association of Electragists—International

S. B. WILLIAMS
Editor

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The Return to St. Louis

Twenty-three years ago the electrical contractors' national convention was held in St. Louis. Then the association was a struggling infant in its fourth year. The topics at the convention, however, were not altogether dissimilar from those of the present. Standardization and trade relations occupied considerable time at the meetings.

From the report of that early convention one thing stood out—the Spirit of St. Louis. Of course, it was World's Fair time and there were lots of things to see, but nevertheless the St. Louis people saw to it that nothing was missed.

And now we return again. There is no World's Fair this year, but there will be no idle moments. The St. Louis Electragists and the Electrical Board of Trade have accounted for every moment for delegates and ladies.

The program is big and broad and tremendous in its possibilities. The regular exhibit spaces have been sold and overflow space may have to be set up to take care of the demand.

All in all, it should be a great convention.

Fear Competition

Why does an electrical contractor put in a bid below what he knows he ought to get for a job? It's easy to find the answer to that question—the real difficulty is to find the way out.

Fear, is the answer to the question. In the first place the contractor is afraid that if he does not quote a low price somebody else will and he will lose the job. Second, he is afraid that if he does not get the job he might be idle. Third, he is afraid if he does not take a lot of work he might not get credit.

Throughout the whole transaction he is afraid—his whole philosophy is fear—afraid of what somebody else might do or what otherwise might happen. The one thing he does not seem to be afraid of is losing money or getting behind in his payments to suppliers.

Fear selling never paid a profit. The man who bids low because he fears somebody else will generally get stung. Profit belongs only to the courageous—those who are not afraid. It does not take courage to take a job below cost. "Fools rush in where angels fear to tread." It takes courage

to stand out for profits. To sell the job on the basis of your ability instead of buying it in price.

Fear is the root of all evil. The successful contractors are those who have substituted courage for fear. They believe in themselves and then prove it.

Another Bond

When the representatives of the several provincial governments met a few weeks ago to agree on the final draft of the first Canadian Electrical Code a further bond of mutuality was cemented between the Dominion and the United States.

Canada has been importuned time and time again to lower the bars so as to permit the use of standard English-made electrical goods. While having the deepest love and respect for the mother country, Canadians realize that the people of North America have come to demand a higher standard. The National Electrical Code was the basis on which the Canadian Code was built.

Canada is to be congratulated on its first Electrical Code. We hope that the leaders in code work on both sides of the border will find many opportunities for friendly conferences. The growth and development in the two codes should go hand in hand.

The New S. E. D.

Since the first of the year The Society for Electrical Development has been in the process of reorganization and now is ready once more to go forward under a national program. For fourteen years the Society has functioned and in that time has been responsible for a large amount of good.

Because the Society is representative of the industry as a whole and does not bear that intimate relation to any one class of business that other national organizations do, it stands in a peculiar position. These other organizations are essentially bodies of policy initiative. The Society having no single interest to speak for is naturally not in a position to initiate policy.

Industry policies affect the several branches and their national associations reserve the right to accept or reject such policies according as their own particular class is passed or disfavored. In its reorganization the Society has

recognized this fundamental principle and in order to be assured that all its actions will have back of them the support of the entire industry it has changed its by-laws so that each national association will be represented on the board of directors by its president and general manager.

By this plan there can be no confusion as to who shall do what. Such activities as the branch organizations should engage in will be handled by them and activities which are industry wide in scope will be handled through the Society.

It is too early to say just what these activities shall be. There are, however, enough industry jobs to be done to keep the Society very busy.

Incidentally, it is contemplated that the Society in its new set-up will provide a forum for discussing things of mutual interest to two or more groups so that it will not be necessary again to set up separate conferences.

The electrical industry has extended in so many directions, it has grown to such a size that it more and more needs an industry workshop and forum—a place where we can keep sight of this great industry as a whole, a place where the full intention of the word co-operation can be achieved.

Unethical Business Practice

There are certain wholesale fixture show rooms where contractors may send customers to pick out fixtures with the thought implanted in the minds of these customers that they are going to get something off. In such places the rule generally is to price up the fixtures to a fictitious level and then allow a discount which will bring the net price to the true price or perhaps to one that is a little higher.

Now the contractor, in such a transaction, is not sharing his discount with his customer as he would have the customer believe, nor is the customer getting any advantage at all. Such practices are unfair on the part of the contractor and the fixture wholesaler.

It stands to reason that a fixture wholesaler who will engage in such practices with a contractor's customers is unlikely to hesitate if it is to his advantage to play unfair with the contractor.

There is no objection to a wholesaler placing his show room at the disposal of his contractor customers who carry no stock, but there is no reason why the wholesaler and contractor should connive to be unethical in making the sale.

Substandard Material

The Colorado Electric League has gone on record as opposing the use of improvised convenience outlets and unapproved or substandard materials. Good work. We wish more leagues would bring this subject out in the open and take a vigorous stand.

We have no right to tamper with public safety by making and selling such material. It does not make the least particle of difference what manufacturer produces the mate-

rial. The fact that that manufacturer did not secure an Underwriters' Laboratories' approval, or even in many cases attempt to secure one, is sufficient evidence that the product is substandard and unsafe.

In making the final draft of its new code Canada came out against substandard electrical goods. Not only can they not be installed but they cannot be sold, thus taking care of the inferior lines sold direct to the public.

The sentiment is growing!

The Golden Rule

Is there something in competitive contracting work that robs men of their principles? We have heard men say that when they found they could not get certain jobs that they had made the other fellows sweat for it. We have found men who knew that certain work morally belonged, if such an expression may be used, to another contractor, but they could not withstand the temptation to take a shot at it. We have found men asking for protection one week and refusing it the next.

What is it that makes men do these things? Of course, there is an old saying that "Everything is fair in business and in love." Maybe it is, but it does not pay. Big men—men who have made real commercial successes in other lines of endeavor—found that out years ago.

The Golden Rule has ever been a good precept. There would be fewer distressed contractors among the big fellows if it were followed more of the time.

Article 5 Split-up

The hardest working article committee on National Electrical Code revision has undoubtedly been that handling Article 5—Wiring Methods. Its program has been long and heavy. For that reason the thought has come to more than one person that there would be much to be gained by dividing the work of the committee among several new committees. Undoubtedly such a step would relieve members of Article 5 Committee of much of the load they are now carrying and it might be possible in that way to put through a program of revision more speedily.

On the other hand would not such a step tend to further the lack of correlation still so evident in the Code?

One of the weaknesses of our National Electrical Code has been its incoherence. Of late we have been making headway by removing many of the inconsistencies. It would be a mistake to jeopardize this progressive tendency by splitting up committee assignments.

If the assignment of the committee is now too heavy perhaps it should have more technical subcommittees which can make the detailed studies and bring their reports to the Article Committee for final action. In this way inconsistencies would be far less likely to occur and perhaps the work could be speeded up.

The committee has still a lot of very important unfinished work. It is hoped that nothing will be done at the present to disturb the situation as it now is.

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70 East 45th St.,
New York City

AT LARGE

G. E. Shepherd,
11 West Market Street,
Wilkes-Barre, Pa.

SECRETARY AND TREASURER, Laurence W. Davis
15 West 37th Street, New York City

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314 Keyser Bldg., Baltimore, Md.

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687 Mission St., San Francisco, Calif.

Publication
L. K. Comstock,
21 East 40th St., New York City

Cost Data
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187 Portage Ave., Winnipeg, Man.

Radio
E. C. Headrick,
87 Broadway, Denver, Colo.

Credit and Accounting
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Past Presidents of the National Electrical Contractors' Association

Charles L. Eidlitz1901-1903
E. McCleary1903-1905
James R. Strong1905-1908
Gerry M. Sanborn1908-1910

*Marshall L. Barnes1910-1912
Ernest Freeman1912-1914
John R. Galloway1914-1916
*Deceased

Robley S. Stearnes1916-1918
W. Creighton Peet1918-1920
James R. Strong1920-1925
Joseph A. Fowler1925-1927

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Alabama:	J. R. Wilcox, 2017 First Ave., Birmingham	D. B. Clayton, Am. Trust Bldg., Birmingham
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California:	C. L. Chamblin, 687 Mission St., San Francisco	Northern Division Edward Martin 182 Fifth St., San Francisco Southern Division C. J. Geisbush, 610 Cotton Exchange Bldg., Los Angeles
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Iowa:	Earl N. Peak, 1603 W. Main St., Marshalltown	J. R. Payton, 13th & Walnut Sts. Des Moines
Kansas:	L. M. Atkinson, 116 E. First St., Pittsburgh	Harry Hagler Salina

State	President	Secretary
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Michigan:	W. F. Fowler, c-o Barker-Fowler Electric Co., Lansing	E. P. Blackman, c-o Motor Shop, Battle Creek
Missouri:	Charles J. Sutter, 1303 Pine St., St. Louis	W. F. Gerstner, 120 North Second St., St. Louis
New York:	A. Lincoln Bush, 906 6th Ave., New York City	H. F. Janick, 235 Berlin St., Rochester
North Carolina:	H. R. Bouigny, P. O. Box 534, Charlotte	W. P. Christian, Greensboro
Pennsylvania:	W. V. Pangborne, 1927 W. Montgomery Ave., Philadelphia	M. G. Sellers, 1202 Locust St., Philadelphia
South Dakota:	Mark J. Hurlbut, Chamberlain	Frank Shuff, Yankton
Tennessee:	R. L. Clift, Memphis	J. A. Fowler, 118 Monroe Ave., Memphis
Texas:	T. L. Farmer, 1809 Main St., Dallas	J. W. Read, 715 Capitol Ave., Houston
Wisconsin:	L. W. Burch, 202 E. Wash'n Ave., Madison	

List of Local Associations

STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS	STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS
ALABAMA			NEBRASKA		
Birmingham (C)	J. R. Wilcox	2017 First Avenue	Lincoln (L)	George Ludden	1329 N Street
ARKANSAS			Omaha (C)	E. H. Brown	1818 1/2 Harney Street
Fort Smith (C)	Edward Ryan	Ft. Smith Lt. & Trac. Co.	NEW JERSEY		
CALIFORNIA			Elizabeth (L)	A. G. Otis	Broad Street
Fresno (C)	Clyde L. Smith	1162 Broadway	Jersey City (C)	John Nairn	38 Oakland Ave.
Glendale (C)	W. L. Hyde,	154 S. Brand Blvd.	Long Branch (C)		
Long Beach (L)	V. Ringle	So. Cal. Edison Co.	(Asbury Park and		
Los Angeles (C)	Helen I. Mikesell	1009 1/2 S. Hill St.	Red Bank)		
Oakland (C)	Laurence R. Chilcote	Hobart & Webster Sts.	Newark (C)	Austin Hurley	Campbell Ave., Long
Pasadena (C)	H. W. Barnes	1331 N. Lake Ave.	Paterson (L)	Branch	
Sacramento	L. W. Sherman	910 Ninth St.	Philipsburg (See Lehigh	Paul H. Jaehnig	435 Orange Street
San Francisco (C)	E. E. Browne	522 Call Building	Valley, Pa.)	George Pape	43 Fair St.
Santa Ana (C)	O. N. Robertson	303 N. Main St.	Union City (C)		
Eureka (C)	J. H. Hilfiker	1717 H Street	NEW YORK		
COLORADO			Buffalo (L)	Frank Zeller	328 48th Street
Colorado Springs (C)	Matt Whitney	208 N. Tejon St.	Brooklyn (C)	W. E. Prosser	87 W. Tupper St.
Denver (C)	E. C. Headrick	89 Broadway	Jamestown (C)	H. F. Walcott	60 Third Avenue
Pueblo (C)	E. F. Stone	So. Colorado Power Co.	Nassau-Suffolk (C)	Henry M. Lund	309 Main Street
CONNECTICUT				Henry T. Hobby	55 Front Street, Rock-
Hartford (C)	A. A. Angello	473 Park St.	New York City		ville Centre, L. I.
Waterbury (C)	D. B. Neth	107 West Main St.	Section No. 1 (C)	Walter Knapp	207 East 43rd Street
Bridgeport (C)	L. E. Finch	529 Newfield Bldg.	Independent (C)	Albert A. A. Tuna	127 East 34th Street
DIST. OF COLUMBIA			Metropolitan (C)	George W. Neil	96 Beekman St.
Washington (L)	P. A. Davis	1328 Eye St., N. W.	Niagara Falls (C)	E. M. King	515 Niagara Street
FLORIDA			Rochester (C)	Theo. T. Benz	278 State Street
Bradentown (C)	W. S. Stewart	W. & S. Elec. Co.	Schenectady (C)	Richard Spengler	421 McClellan Street
Daytona Beach (C)	C. Leotah Benson	324 1/2 S. Beach St.	Syracuse (C)	Fred P. Edinger	802 East Water St.
Deland (C)	C. W. Allcorn	132 No. Florida St.	Utica (C)	W. C. Balda	228 Genesee Street
Fort Myers (C)	P. K. Weatherly	Thompson-Weatherly Co.	Westchester Co. (C)	Jack Lalley	14 Mnr. Hse. Sq., Yonkers
Indian Riv. Dist. (C)	I. A. Paige	Vero Beach	Yonkers (C)	Louis Mayer	485 South Broadway
Jacksonville (C)	W. A. Harper	108 W. Bay St.	OHIO		
Miami (C)	E. A. Robinson	118 N. W. First Ave.	Akron (C)	E. C. Rishel	540 East Avenue
Orlando (C)	Solon M. Lantz	833 E. Concord	Canton (C)	H. S. Hastings	301 New Vickery Bldg.
St. Petersburg (C)	Gardiner Blackman	P. O. Box 992	Cincinnati (C)	J. F. Riehle	1642 Cedar Ave.
Tampa (C)	P. F. Lyons	73 Walton St.	Cleveland (C)	F. T. Manahan	Chester Twelfth Bldg.
GEORGIA			Columbus (L)	O. A. Robins	1242 Oak Street
Atlanta (C)	B. K. Laney	Byck Electric Co.	Lorain (C)	A. B. Walton	3150 E. Erie Ave.
Savannah (L)	Sylvan M. Byck		Toledo (C)	Fred C. Dunn	Builders' Exchange
ILLINOIS			Dayton (C)	Clarence Carey	1107 South Brown St.
Chicago			Massillon (C)	F. D. Mossop	c-o Mesco Electric Co.
Electrical Contractors' Association	J. W. Collins	230 No. LaSalle St.	Northern Ohio (C)	R. A. Wentz	Elyria
Master Elec. Contractors' Association			OKLAHOMA		
Decatur (C)	F. J. Boyle	304 S. Halsted St.	Pawhuska	C. G. Sego	Pawhuska
Granite City (C)	Earl Weatherford	114 East William St.	OREGON		
Peoria (C)	William W. Huxel	1254 Niedringhaus Ave.	Portland (C)	J. R. Tomlinson	51 Union Ave. N.
Rockford (C)	L. B. Van Nuys	238 So. Jefferson Ave.	PENNSYLVANIA		
Springfield (C)	Donald Johnson	106 North Second St.	Altoona (C)	Walter Bracken	Leechburg
Wheaton (C)	A. D. Birnbaum	916 West Cook St.	Allegheny Valley	E. G. Jackson	12 West Third Street
INDIANA	E. C. Krage	133 West Front St.	Du Bois (C)	C. E. Blakeslee	12 E. Long Av.
Lake County (C)	A. R. Irwin	3461 Mich'n Av., Ind. Har.	Erie (C)	R. D. Goff	11th and French Sts.
Indianapolis (L)	A. W. Kruege	2405 E. Tenth St.	Lehigh Valley (C)	A. W. Hill	Bethlehem
Michigan City (C)	Walter A. Sassodeck	913 Franklin St.	Philadelphia (C)	M. G. Sellers	1202 Locust Street
Muncie (C)	Harry McCullough	113 W. Howard St.	Pittsburgh (C)	D. A. Fleming	518 Empire Bldg.
South Bend (C)	R. A. Frink	1338 Howard St.	Wilkes-Barre (L)	Ambrose Saricks	25 No. Main Street
Terre Haute (C)	C. N. Chess	523 Ohio St.	RHODE ISLAND		
IOWA			Providence (C)	H. E. Batman	36 Exchange Place
Cedar Rapids (C)	H. E. Neff	94 First Ave., West	SOUTH CAROLINA		
Davenport (C)	Louis F. Cory	510 Brady St.	Charleston (L)	J. P. Connolly	141 Meeting Street
Des Moines (C)	R. C. Trembath	Bankers' Trust Bldg.	SOUTH DAKOTA		
Fort Dodge (C)	J. A. Paul	16 So. Twelfth St.	Sioux Falls	H. W. Claus	326 S. Phillips Ave.
Sioux City (C)	E. A. Arzt	211 Fifth St.	TENNESSEE		
Waterloo (C)	R. A. Cole	Cole Bros. Elec. Co.	Chattanooga (L)	P. W. Curtis	725 Walnut Street
KANSAS			Knoxville (L)	Jerry G. Cason	303 West Church St.
Salina (C)	C. G. Loomis	814 Cedar St.	Memphis (L)	J. J. Brennan	12-16 So. Second St.
Wichita (C)	P. W. Agrelus	Wichita	Nashville (C)	J. T. Shannon	c-o Electric Equip. Co.
KENTUCKY			TEXAS		
Lexington (C)	J. H. Brock	235 East Main St.	Beaumont (C)	J. A. Solleder	Houston & Bolivar Sts.
Louisville (C)	C. L. W. Daubert	921 South Third St.	Dallas (C)	P. B. Seastrunk	2032 Commerce St.
Paducah (L)	K. H. Knapp	c/o Paducah Electric Co.	Houston (C)	J. W. Read	715 Capitol Avenue
LOUISIANA			UTAH		
New Orleans (C)	I. G. Marks	406 Mar. Bk. Bldg.	Ogden	B. Kristofferson	2249 Washington Ave.
Shreveport (C)	R. L. Norton	620 Marshall St.	Salt Lake City (C)	C. Louis Collins	215 Kearns Bldg.
MARYLAND			VIRGINIA		
Baltimore (C)	A. P. Peterson	515 Cathedral St.	Lynchburg (C)	J. L. Fennell	c-o Fennell & App
MASSACHUSETTS			Norfolk (L)	A. W. Cornick	200 Plum St.
Lowell (C)	George A. Ryan	79 Middle St.	Richmond (C)	E. M. Andrews	15 N. Twelfth Street
Haverhill (C)	H. W. Porter	14 West St.	WASHINGTON		
Malden (Medford, Ever-	H. J. Walton	c/o Malden Electric Co.	Seattle (L)	P. L. Hoadley	Seaboard Building
ett and Melrose) (C)	C. S. Foster	220 Dwight St.	Spokane (C)	William Stack	W. 1121 Cleveland St.
Springfield (C)	John W. Coghlin	259 Main St.	WEST VIRGINIA		
Worcester (L)			Wheeling	Peter J. Erb	1414 Eoff St.
MICHIGAN			WISCONSIN		
Detroit (C)	N. J. Biddle	112 Madison Ave.	Green Bay (C)	V. E. Grebel	531 S. Broadway
Grand Rapids (C)	T. J. Haven	1118 Wealthy St., S. E.	Madison (C)	Carl J. Marsh	710 Beaver Bldg.
Kalamazoo	E. R. Hummel	1121 Seminary St.	Milwaukee (C)	E. H. Herzberg	1604 Wells Street
Saginaw (C)	E. T. Eastman	209 Brewers Arcade	Racine (C)	Joseph J. Small	1910 Linden Ave.
MINNESOTA			CANADA		
Duluth (L)	Morris Braden	c-o Minn. Pow'r & Lt. Co.	Montreal (C)	George C. L. Brassart	674 Girouard Ave.
Minneapolis (C)	W. I. Gray	209 Globe Building	Toronto (C)	J. A. McKay	302 Excelsior Life Bldg.
MISSOURI			Vancouver (C)	J. C. Reston	579 Howe St.
Kansas City (C)	Walter C. DeBold	City Bank Bldg.	Winnipeg (C)	Fred Ball	300 Princess St.
St. Louis					
Electragists' Ass'n (C)	W. F. Gerstner	120 No. Second St.			
Electric Employers' Association (C)	G. L. Gamp	Wainwright Bldg.			

(C) designates exclusively Contractor-Dealer organization.

(L) designates an Electrical League

JULY ACTIVITIES

Squires Succeeds Forsyth on N.F.P.A. Committee

F. N. M. Squires, chairman of the standards committee of the Eastern Association of Electrical Inspectors and assistant chief inspector, New York Board of Fire Underwriters, has been appointed chairman of the Committee on Article 8 of the Electrical Committee of the National Fire Protection Association, to succeed J. S. Forsyth, who asked to be relieved as chairman. This article deals with "Automatic Protection of Circuits and Appliances." Mr. Squires is the editor of "Code Chats," a monthly department of THE ELECTRAGIST given over to a discussion of Code problems as affecting the electrical contractor. Mr. Forsyth's resignation was because of ill health and he retains his membership.

Industry Leaders to Speak at Camp Co-operation

The tentative program for Camp Co-operation VII, which is to be held at Association Island, Henderson Harbor, N. Y., from August 28 to 31, includes addresses by the heads of four major groups of the industry, Howard T. Sands, president of the National Electric Light Association; Gerard Swope, president of the National Electrical Manufacturers' Association; G. E. Cullinan, chairman of the executive committee of the Electrical Supply Jobbers Association, and Clyde L. Chamblin, president of the Association of Electragists, International. The subject of these men will be the Society for Electrical Development as seen by the groups they represent. They are scheduled to talk on Sunday, August 28, at 7:30 p. m.

The program will include discussions by electrical league representatives from all parts of the country covering various features of league work, and will include a talk by S. L. Nicholson, of N. E. M. A., on the uniform electrical ordinance.

Tuesday evening's program includes talks on the national associations by

Paul S. Clapp, managing director of the N. E. L. A.; A. E. Waller, managing director, N. E. M. A., and Laurence W. Davis, general manager of the A. E. I.

Toledo to Hold Rewiring Campaign

The Electrical League of Toledo has prepared preliminary plans for a comprehensive rewiring and refixturing campaign to be carried on at some later date. The plan has not yet been officially adopted by the league, so the details are not yet available.

California Estimators Publish Their Own Paper

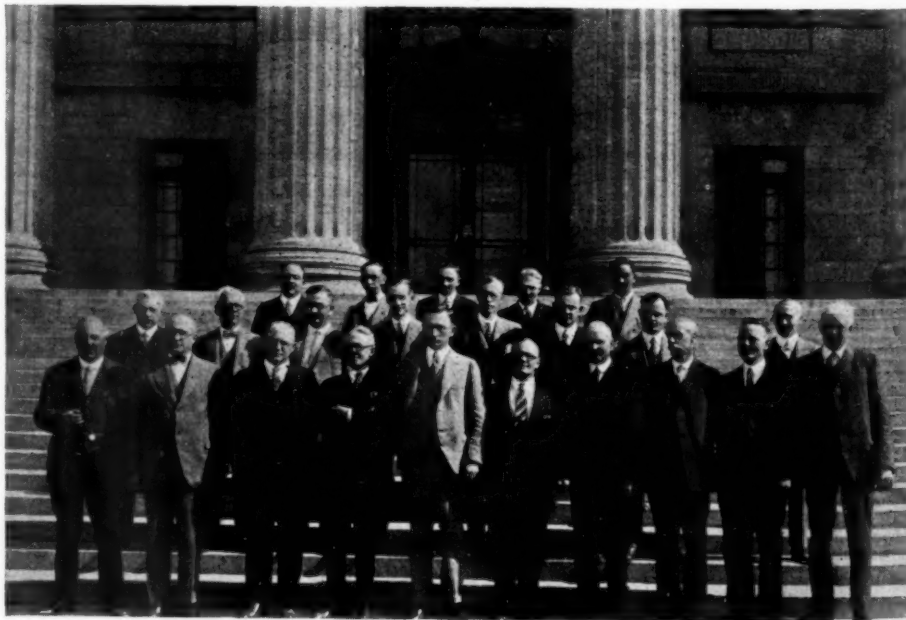
"The Estimator," a mimeographed news bulletin of the California Estimators' Section, California Electragists, Southern Division, made its initial appearance on July 7. The first issue is of five pages and is printed on pages 8½ in. by 14 in. It is planned to have a new issue ready for each meeting of the section.

The editorial committee of the new paper is made up of J. R. Wilson, chairman; H. LaPrade, H. K. Burdick, W. L. Robar, C. J. Geisbush, G. R. Dehn, T. H. Few and H. W. Barnes.

Drafters of New Canadian Code

REPRESENTATIVES of the several provincial governments and others who were present at Winnipeg during the week of June 13 to assist in the drafting of the new Canadian Electrical Code are pictured below. They are, front row, left to right: H. F. Strickland, Toronto; J. N. Mochon, Quebec; H. W. Taylor, Vancouver; F. A. Cambridge, Winnipeg; W. P. Dobson, Toronto; C. M. Tait, Montreal; R. J. Driscoll, Toronto; A. S. L. Barnes, Toronto; W. J. Canada, New York, elec-

trical field secretary, N. F. P. A.; B. Stuart McKenzie. Second row: George Newman, Winnipeg; F. W. Moffatt, Weston, Ont.; J. D. Peters, Moose Jaw, Sask.; Prof. E. P. Featherstonebaugh, Winnipeg; Prof. W. F. McKnight, Halifax; J. W. Southin, Point Gray, B. C.; F. F. Dowling, Vancouver; George J. Brown, Manitoba. Third row: J. H. Schumacher, Winnipeg; D. C. Russell, St. Boniface, Man.; J. R. Cowley, Saskatoon, Sask.; A. G. Hall, Toronto; S. R. Parker, Regina, Sask.



Alberta Contractors Meet at Calgary

The semi-annual convention of the Alberta (Canada) Provincial Electrical Contractors' Association was held at Calgary on June 25. Representatives were present from cities and towns throughout the province. The jobbers of Calgary gave a banquet in the evening to the contractors and city electrical inspectors of the province at the Palliser Hotel. The following day many members made a trip to Banff by bus.

N. F. P. A. Forming Committee on Wiring of Ranges

The Electrical Committee of the National Fire Protection Association, of which A. R. Small is chairman, is forming a technical subcommittee of the Committee on Article 16 to give consideration to electric range circuits. Representatives have been invited from the National Electric Light Association, National Electrical Manufacturers Association, Association of Electragists, International; Western, California, Northwest, Eastern and Canadian associations of electrical inspectors and Underwriters' Laboratories.

Mr. Small states that the correspondence crossing his desk during the past three years indicates a diversity of practice in various localities with respect to such range wiring, especially in the use and location of a control switch.

Refixturing to Feature A. L. E. A. Campaign

The Artistic Lighting Equipment Association's board of directors ratified at the recent meeting of the organization at Atlantic City the plans for a sales promotion campaign, a prominent part of which is designed to increase the market for new fixtures in old homes. Fifteen thousand dollars was voted to carry on the work, which is expected to start in about a month.

The plans include extensive trade paper advertising, designed to popularize the association's emblem, the attaching of a string tag bearing this emblem on all products turned out by member companies and a series of newspaper advertising mats for dealers to use in their local papers.

It was also voted to hold the 1928 national exhibition of the association at Chicago during the month of June. This is an innovation, since heretofore they have been held during January or February.

No Questionable Materials Sold by Denver Men

A recent bulletin of the Electrical League of Colorado states that a recent survey of the dealer members showed that unapproved, improvised convenience outlets are not used by them. Not one had them in stock nor had any intention of selling them. A manufacturer member stated that he refuses to sell them although he is agent for a com-

pany that is endeavoring to market such fittings along with its approved devices.

Detroit Fixture Dealers Reorganize

The Detroit Lighting Fixture Dealers' Credit Association has dissolved and its place has been taken by the Retail Fixture Dealers' Association. The new organization includes all the members of the old association and has more than double its membership.

The officers are: President, C. E. Scott, Detroit Mantel and Tile Company; vice president, Max Kogan, Kogan Electric Company; treasurer, E. Hoeck, The Netting Company; secretary, Floyd Smith.

First Code Interpretations Made Public

THE committee recently formed in the National Fire Protection Association to make interpretations of the 1925 National Electrical Code and its 1926 supplement has reported its findings in five out of the six requests for interpretations that it has received. The rulings on the first question have not been made public since it was necessary for it to be referred back to the sender for restatement as to the particular Code provision involved.

These questions and findings are automatically referred by Chairman A. R. Small of the Electrical Committee to the committees on the articles involved to determine if any changes in form or substance of the provisions of the Code are in order, in view of the raising of the questions.

The requests covered a wide variety of Code rules and are printed here in full.

"Center of Distribution"

QUESTION NO. 2: *What is a "center of distribution" as referred to in paragraph (e) of Section 807?*

ANSWER: The point where the three wires constituting a 3-wire branch circuit are connected in accordance with the provisions of the code to the wires which supply them. The intent of the restriction "neutrals shall not be interconnected except, etc.," is to prohibit deriving a 3-wire branch from a circuit consisting of the two outer wires of a 3-wire system run for some distance from a center of distribution and then joined by the grounded neutral wire of

a separate branch circuit to accomplish for the remaining portion of the original 2-wire circuit the equivalent of a 3-wire circuit with grounded neutral.

"Single Occupancy or Management" and "Master Service"

The third question required an amplifying statement to make it sufficiently clear for interpretation. It had to do with two adjoining buildings of common ownership, but of different and independent occupancies, one of stores and offices and the other of stores and a theater. The latter premises are leased to a theatrical corporation. A 2,300-volt step-down transformer is to be installed in the office building, located and equipped in a standard manner. Its secondary supplies a switchboard within the office building from which separate circuits, each equipped with switches and fuses, supply the two buildings.

QUESTION NO. 3: *Does the fact that these buildings are owned by one man comply with the requirements of 401-b of the 1925 edition of the National Electrical Code?*

ANSWER: Common ownership is not sufficient to establish "single occupancy or management," as this expression is used in the paragraph cited.

QUESTION: *What is a Master Service; do the conditions set forth come under the definition of Master Service as referred to in 405-k of the 1925 Edition?*

ANSWER: The term "master service" as used in the paragraph cited refers to the service conductors and "equipment"

which supply two or more buildings under single management.

One Outlet or More Than More?

QUESTION NO. 4: *Filling stations equipped with gasoline pumps, the pump shipped equipped with, say, three light sockets, one at the top for a single globe and one on each side of the gasoline container to light the gauge, the sockets being on arms as a part of the pump equipment and shipped ready to connect to the light circuit, the connections being made in the base of pump, the light circuit being run underground in conduit terminating at the base of pump, . . . Can this pump be considered as a light fixture and be classed as one outlet or should each light be classed as one outlet? This question would also apply to soda fountains that are shipped and wired with sockets for quite a number of lights.*

ANSWER: The word "fixture" in the definition of "outlet," paragraph (a) Section 807, includes illuminated appliances of the sort mentioned.

The illuminated light holders of such illuminated fixtures may be disregarded in applying paragraph (h) of Section 807.

Accessibility of Pull and Junction Boxes

QUESTION NO. 5: *Does paragraph (p), Section 701, requiring pull boxes and junction boxes to be accessible, ap-*

ply to covers of outlet boxes found in an installation of rigid conduit embedded in plaster of paris and installed for decorative purposes and outline lighting on the outside of a building? (Outlet box covers with receptacles are centers of plaster of paris rosettes and are concealed for the sake of appearance.)

ANSWER: The covers are accessible within the intent of the definition of the word "accessible" in Article 1 and its use in paragraph (p) of Section 701 under the conditions described in the question since no permanent part of the building proper must be removed when working on the rigid conduit system involved in this display unit.

Branch Fuses

QUESTION NO. 6: *What is meant by the branch fuses as provided for in the third line of paragraph (b), Section 806? It seems that some inspection departments are accepting final branch circuit fuses regardless of whether or not they are located at the service as provided for in the heading of the section.*

ANSWER: The branch service fuses need not be located close to other service entrance automatic overload protective equipment provided the wires between the branch fuses and the main service equipment are properly protected by the latter.

include employees employed by such contractor to do or supervise such work."

The new laws are the result of a decision of the Supreme Court of the state three years ago which declared that municipalities that had been supervising the installation of electrical equipment and collecting fees for inspection service were exceeding the powers given to them by the legislature. Bills were introduced before the 1925 legislature to correct this condition, but due to lack of care in preparation they were declared unconstitutional the following year.

A united effort on the part of all branches of the industry was made late last year, led by The Electric Association of Chicago and supported by the Illinois Electragists and almost every electrical contractors' local in the state to draft bills that would meet the situation that had arisen because of lack of laws.

Following the passing of the two bills the Illinois Chapter, Western Section, International Association of Electrical Inspectors, prepared and distributed to the cities and towns of the state two model ordinances, one providing for registration and the other covering inspection. The latter goes one step beyond the uniform ordinance in that it provides a certain latitude for local inspection and law-making interests to provide for rules and regulations beyond the Code. The section containing that clause follows:

"No certificate of inspection shall be issued unless the electrical equipment is in strict conformity with the provisions of the ordinances of this city and the statutes of the State of Illinois; provided, however, that compliance with the regulations as laid down from time to time in the National Electrical Code, unless in conflict with such ordinances or statutes, shall be *prima facie* evidence of proper installation or alteration."

OBITUARIES

Sigmund Bergmann

Sigmund Bergmann, inventor of the Bergmann tube for wiring, founder of the Bergmann Electrical Works in that city, died last month in Berlin, Germany, where he had resided since his return there from this country. He was

New Electrical Laws Passed by Illinois Assembly

THE new Illinois laws concerning "the regulation, installation, alteration and use of electrical equipment" which have been agitated by the Illinois Electragists and other branches of the industry in that state, have been passed by the General Assembly and became effective on July 1.

The new bills provide that any municipality within the state may establish an electrical inspection department and an electrical commission of five members to recommend safe and practical standards and specifications for the installation, alteration and use of electrical equipment and make regulations governing the issuing of permits and inspection procedure.

In municipalities where inspection

departments already exist, jurisdiction over permits and inspection work is given by the new law to this department. A fine of from \$5 to \$50 is the punishment, after conviction, for failure to comply with the ordinance in such municipalities.

The act also requires an annual registration fee of \$25 for the electrical contractor. This is applicable to any municipality in the state, and when once paid entitles him to do work anywhere in the state. The term "electrical contractor" has been defined in the act as "any person, firm or corporation engaged in the business of installing or altering by contract electrical equipment for the utilization of light, heat and power . . . but the term does not

born in Germany, but came over here at an early age and while in the United States was associated with Thomas A. Edison for a time.

He established his own business, however, before he had been here very long to manufacture telegraph printers, burglar alarms, bells, batteries, telephone appliances and similar articles. Mr. Bergmann gave much assistance in the pioneer work on the incandescent lamp, and many of Edison's experiments were made in the Bergmann shop. He organized the General Incandescent Arc Light Company in New York and became its president and shortly after founded the New York Electric Equipment Company.

Mr. Bergmann returned to Germany and engaged in the manufacture of electrical specialties, accessories, incorporating the ideas he had learned in America, and the business later developed into one of considerable size.

Charles A. Morss

Charles A. Morss, vice-president of the Simplex Wire & Cable Company, died on July 4 at his home in Brookline, Mass. He was in poor health for several months. After several years in the woolen business he was appointed treasurer of the Simplex Company, but resigned in 1917 to become governor of the Federal Reserve Bank of Boston. He resigned this post in 1922 and later returned to the wire company as vice-president. He was a director in the wire company and also in the Simplex Electric Heating Company.

Jay B. Odell

Jay B. Odell, a vice-president and director of the Western Electric Company, died on July 8 at the New Rochelle (N. Y.) Hospital following an operation for appendicitis.

Mr. Odell, who was forty-four years old, was born in Iowa and was graduated from Cornell in 1904. He entered the employ of the Western Electric Company immediately after. He was an executive in the distributing department and manager of the distributing house at Richmond, Va., and New York City, and in January, 1926, was elected a vice-president of the company in charge of purchasing and traffic, the post he occupied at the time of his death.

He is survived by his wife and two children.

RED SEAL NOTES

Over 300 Applications in June

The report for the month of June on Red Seal activities, made public by the Society for Electrical Development, shows that 325 applications were received during the month and 180 awards were made. For the first six months of the current year a total of 2414 applications and awards was received against 2,698 for the entire year of 1926.

Detroit led the June listings with 61 applications and 45 awards. Pittsburgh, with its affiliated leagues, reported 46 applications and 17 awards. Washington showed 26 applications and but one award for the month. In Canada Toronto had 201 applications and 54 awards and Vancouver was next in line with 40 and 23.

List of Homes Sent to Realtors

The Hudson Valley Electrical League has inaugurated a scheme of sending the first of each month to all the real estate men in its territory a list of houses that have been pledged Red Seal during the previous month. The first letter went out under date of July 1 and in addition to listing 38 Red Seal homes as being

for sale or for rent, contained some reasons for making homes Red Seal. It suggests that if Red Seal is added to the features of properties listed for sale or rent it will help in the disposal of the houses.

Red Seal Apartments in Favor

The Society for Electrical Development reports that Washington has received Red Seal applications for eight apartment buildings with a total of 125 apartments; the Calumet Electric League in its first month of operation secured a 44-apartment job; an award has been made by the Border Cities league to a six-apartment building and an application has been received for one of 15 apartments; the Electric Association of Chicago has an application for an apartment building to house 72 families.

Increase in Number of Detroit Builders

The number of builders in Detroit who are known as Red Seal builders was increased from 58 to 97 during the month of June. A complete list of all builders who have built Red Seal houses since the start of this year is published every month in the building section of one of the Detroit newspapers.

Toronto Gives Seal for Store Lighting

THE Electric Service League of Toronto has extended its Red Seal activities to take in stores, and now a special lighting seal has been prepared for those stores whose illumination comes

watt capacity for each 100 sq. ft.. Where this rating, on two or more rows, creates an odd outlet in any rectangular area an extra outlet shall be added. Rows shall not be more than 10 ft. apart. Two rows in stores 14 ft. wide and over, increasing in number on the 10-ft. distance basis according to width. One duplex convenience outlet must be on each side and back wall and not less than one for every 30 ft. of wall length.

Window lighting outlets shall be of 200-watt capacity and not more than 15 in. apart on full width of glass front. A duplex convenience outlet shall be placed in each window. A spotlight outlet and sign circuit are recommended. In the cellar one lighting outlet for every 100 sq. ft. of floor space. The service must be 50 percent excess capacity over connected load, the minimum being 100 amp. in any case. Housekeeping apartments must be rated separately.



up to the standard set by the league.

In the store interior the specifications call for one outlet of not less than 200-

News Notes Concerning Contractor-Dealers

The Cunningham Electric Shop is the name of a new store opened in Painesville, Ohio, on North St. Clair Street. It will handle household appliances only and has secured county representation for an electric refrigerator, vacuum cleaner and clothes washer. E. L. Cunningham is the general manager and C. A. Miller will have charge of the sales department.

T. H. and Ira Dixon are making plans to open an electric store at Lafayette, Ind.

The Farrell Electric Shop, Farrell, Pa., was recently opened by George Vermeire, who was formerly connected with the Electric Service and Supply Company, Sharon, Pa. The new store, which is located at 704 Broadway, will handle a full line of lighting fixtures and do wiring.

The Eddy Electric Service, Millburn, N. J., has moved from its former location on Main Street to larger quarters on Millburn Avenue. In the new loca-

tion a complete line of lighting fixtures is carried. Albert J. Eddy is president of the organization.

Gene and Detre Benoit, brothers, have opened an electric shop at 911 South Ninth Street, San Jose, Cal. Contracting and repair departments will be maintained.

E. M. Crose, Pawling, N. Y., has moved his store from the Utter Building to the Dutcher House Block.

H. D. Thayer Electric Shop has moved from 265 Main Street, Conneaut, Ohio, to Washington Street. The hardware branch which was formerly carried on in connection with the electrical business has been abandoned, and the new store will be devoted entirely to contracting and appliances.

E. J. Sayre has opened an appliance store on Washington Street, Knox, Ind., which he will run in conjunction with his contracting business.

Page Electric Shop is the name of a new business started in Burbank, Cal.,

by S. E. Page. Mr. Page has been in charge of the electrical work of a chain store organization and has gone into business for himself. The business will include contracting work.

Gonzales Electrical Company has been formed in Gonzales, Cal., by J. V. Bennett and Walter Michaud. Both men have been engaged in the contracting branch for some years, and the new business will feature contracting and repair work.

The Ben Allen Electric Company, Lexington, Ky., has started business at 189 North Limestone Street. Mr. Allen recently returned from Miami, Fla., where he owned the Benson Electric Company.

A company has been organized in Archbold, Ohio, by D. J. Vernier, Walter Dilworth and John Michaely to open an appliance store. A feature of the activities planned by the new company is the holding of "electrical fairs," at which household appliances will be demonstrated.

A new electrical firm under the name of Austin & Johnson has succeeded the Louis E. Buri Electric Company in Blanchardville, Wis. Mr. Austin will attend to the wiring business of the company and Mr. Johnson will look after the store.

John E. Oust and Kenneth B. Robertson have organized an electrical company at Merced, Cal. They intend to erect their own building and have already purchased a site. A modern tile and brick structure will be built. The new company has already several large wiring contracts.

Sale of the Smith Appliance Shop at 337 West Van Buren Avenue, Albuquerque, N. M., to Burt Dorris has been announced. The store has been completely renovated.

Harry Hill Electric Shop opened for business on June 6 at 210 Court Street, Muskogee, Okla.

Casey Electric Service Company, Chicago, has moved to its new building at 1534 West Lake Street.

New Electragists

The following contractor-dealers have made application and been accepted into the A. E. I. since the publication of the last list in the July issue:

ALABAMA	IOWA	KANSAS
Birmingham:	Burlington:	Wichita:
O'Keefe & Lyons Elec. Co.	Friedel Elec. Shop	Foss Elec. Co.
Roberts Elec. Co.	Home Elec. Co.	
	Waugh Bros. Radio & Electric	
CALIFORNIA	Cedar Rapids:	MISSOURI
Kingsburg:	Cedar Rapids Elec. Sup. Co.	Kansas City:
C. Wiley Johnson Co.		Atlas Elec. Co.
Los Angeles:	Dubuque:	NEW YORK
International Elec. & Machinery Co.	Appel-Higley Elec. Co.	Dunkirk:
San Bernardino:	United Electric Co.	The Home Elec. Co.
Finley-Hunt Co., Inc.	Fort Madison:	SOUTH DAKOTA
San Jose:	Modern Elec. Co.	Elk Point:
Coast Electric Service.	Paul Elec. Co.	Ven Elec. Service
Van Nuys:	West End Elec. Co.	WASHINGTON
Van Nuys Elec. Co.	Mason City:	Seattle:
	Burke-Thomas	Arrow Elec. Co.
	Ottumwa:	
	Acorn Elec. Co.	
	Central Elec. Co.	
	Poling Elec. Co.	

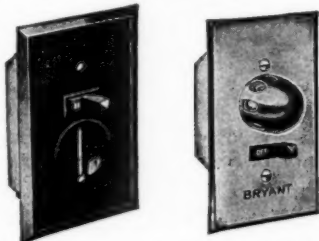
News of the Manufacturers

Wiring Devices

The Bryant Electric Company, Bridgeport, Conn., has brought out an armored pony attachment plug known as No. JZ, shown below to the left. It is steel covered and cadmium plated and according to the manufacturer will not tarnish. Another new device



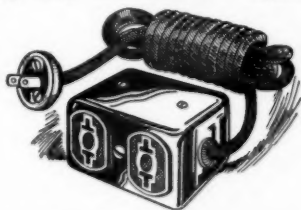
is an attachment plug, known as No. 778, which is brown in color and has small cord hole (9/32 in.). The metal parts are nickel plated. It is shown on the right.



The same company has brought out a one-gang combination toggle switch and receptacle, shown above to the left, known as No. 2979. The receptacle base is made in one piece with the plate and the surface around the slots is circular and concave, making insertion of the plug an easy matter. To the right is shown a new double-pole tumbler switch and pilot light combination, known as No. 2959, and which comes ready wired. This device is similar to the same company's No. 465 combination except that a tumbler switch is used and the dome has been made smaller and more compact.

Table Tap

Fullman Manufacturing Company, Latrobe, Pa., has placed on the market a table tap provided with two standard duplex recep-

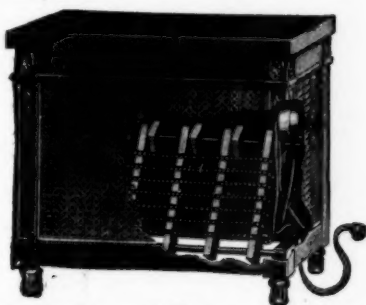


tacles enclosed in a heavy stamped brass housing and finished in nickel plate. The device is small and compact and is provided with a seven-foot silk-covered cord and standard attachment plug. It is designed for the top of the dining or serving table and can be fastened on the edge of the table if desired.

Heater

Sleicher, Inc., Gary, Ind., has brought out an air heater based upon the principle that warm air rises and cold air falls. The heat is derived from tape-like coils, and three and

five stages of heat can be provided, depending upon the size of the heater. The heater comes in two types, cabinet and wall, the former being shown in the illustration. The



former type is available in various sizes from 22 in. by 20 in. by 12 in. to 40 in. by 32 in. by 12 in. and is built in a variety of period designs. The wall heater measures 25 in. by 8½ in. by 3 in. They are marketed under the trade name "Konvektair."

Lighting Unit

The F. W. Wakefield Brass Company, Vermilion, Ohio, announces a new totally enclosing semi-indirect lighting unit for residence and hotel guest room service. It consists of an embossed hanger which accommodates a globe similar to that used in this company's office lighting unit. The globe is of a crystal



glass, the upper part being clear and having a sloping contour which "sheds" much of the dust which falls upon it, thus minimizing maintenance and insuring a high average of efficiency, according to the maker. The bowl of the globe is treated with a special enamel which has the translucence, texture and color of fine alabaster and is decorated with a simple design in India tint or buff.

Lamp Guards

Flexible Steel Lacing Company, 4607 Lexington Street, Chicago, has placed on the market six additions to its line of lamp



guards. They are designed for lamps 4 in. long or less. They are made in the key-locking, non-locking and portable types to fit standard brass and 1½-in. weatherproof sockets. The key-locking guard is shown.

Transformer

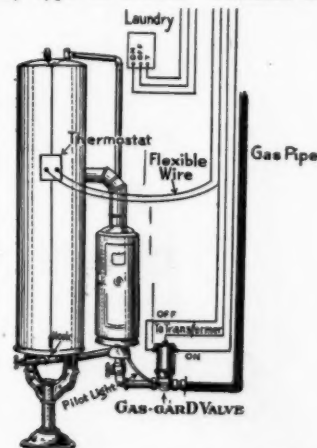
Auth Electrical Specialty Company, 422 East 53rd Street, New York City, has brought out a device to supply direct current at low voltage. It is marketed under the trade name "Auth-O-Former." The manufacturer describes its application as being analogous to that of the alternating-current transformer. The primary voltage of this device is supplied by the 110-volt direct-current lighting service, and the secondary voltage may be of any predetermined value between 6 and 32 volts. The change is made by substituting a different screw-base resistance. Voltage reduction is obtained through a potentiometer circuit using resistances and relays. The standard device can be used only on open circuit systems. It is 20 in. high, 12 in. wide and 8 in. deep.

Threadless Fitting

Erie Malleable Iron Company, Kondu Division, Erie, Pa., has brought out a threadless fitting which is said to make a watertight connection between the conduit and the box. It is intended for use on work exposed to the weather. The new fitting is an addition to the company's "Kondu Box" line.

Gas-Heater Control

Gas-Gard Company, 375 Main Street East, Rochester, N. Y., has brought out an electric hot water heater control designed for use with any type of heater. Switches may be

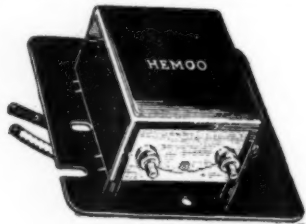


placed in any part of the house desired and from these points the heater may be turned on and off as desired. Red lights in the switches indicate whether or not the heater is in operation, and a thermostat turns it off when the maximum heat is reached. Illustration shows laundry control only.

Bell Transformer

George Richards & Co., 557 West Monroe Street, Chicago, Ill., recently placed on the market a bell-ringing transformer mounted on a cover 4 in. square which is punched so that it will fit a 3¼-in. round box, a 4-in. round box or a 4-in. square box. The cover is perforated and scored so that the rim can be knocked off to form a 4-in. round cover if de-

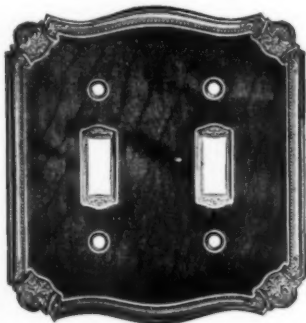
sired. The transformer cover is equipped with a bushed knockout for a drop cord installation in the same outlet box. The new device, which is marketed under the trade



name "Hemco," is furnished in single-circuit secondary and three-circuit secondary, 110 volts, 60 cycles. It is designed primarily for ringing door bells, operating door openers, etc.

Wood Inlaid Plates

The Bryant Electric Company, Bridgeport, Conn., has brought out a line of wood inlay flush plates designed for the higher grade of residential work and buildings where great



care has been given to the design of interior decoration. The plates are made of circassian walnut or mahogany inlaid with nickel silver or bronze.

Reflector

Reflector and Illuminating Company, 1415 Jackson Boulevard, Chicago, has brought out a show window reflector specially designed for use with the new inside frosted lamps.



The manufacturer states that photometric tests have shown that better control of the light and greater efficiency is obtained with these new reflectors than is possible with reflectors of the fluted, corrugated or stippled types when this style of lamp is used.

Across-the-Line Starter

The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has announced a very small across-the-line starter for motors of 5 h.p. and under which gives push-button control of starting and stopping, and provides thermal overload and no-voltage protection.

The extremely small size permits of its being mounted where the control station would ordinarily be placed and the extra wiring and cost of a push-button station may thus be saved. To adapt the starter for any horsepower within its rating it is necessary only to insert the proper size of heating coils in the thermal overload relay.

Manufacturing Notes

Announcement has been made of the merger of six of the leading porcelain plants in the country, Findlay Electric Porcelain Company, Findlay, Ohio; Federal Porcelain Company, Carey, Ohio; General Porcelain Company, South Parkersburg, W. Va.; National Porcelain Company, Carey, Ohio; Ravenswood Porcelain Company, Ravenswood, W. Va., and Cincinnati Porcelain Company, Cincinnati, Ohio. The general offices of the combine will be in Findlay.

The officers of the new organization are: President, J. E. Bicknell; vice president, F. E. Owen; secretary-treasurer, John G. Loy. The company, which is capitalized at \$5,000,000, will manufacture a complete line of porcelain products for the electrical and radio trades.

Trumbull-Vanderpool Electric Manufacturing Company, Bantam, Conn., held its annual sales conference at the Blue Spruce Inn, Bantam Lake, on July 18, 19 and 20. Representatives from all sections of the country were present. The company has issued a catalog covering the use and application of all forms of safety switches.

The Johns-Manville Corporation announces the election of Theodore Merseles as president. H. E. Manville, who has served as president since the death of his brother, T. F. Manville, in 1925, has been elected chairman of the board of directors. Mr. Merseles has been president of Montgomery, Ward & Co. and will continue as chairman of the executive committee of that company and as a director.

Steel City Electric Company, Pittsburgh, Pa., has issued its general catalog No. 35. It is of 64 pages and has a very effective colored cover.

Pittsburgh Reflector Company, Pittsburgh, Pa., has sent out a broadside in color called "Artificial Skylight Illumination." It deals with the illumination of the Horace C. Henry Art Museum.

Central Tube Company, Pittsburgh, Pa., has announced the appointment of A. S. Lindblad as district sales manager in charge of the Chicago office. David M. Cooper, Jr., will be his assistant in the new post.

Appleton Rubber Company, Franklin, Mass., reports that at a recent meeting of the stockholders the following were elected officers of the company: H. O. Phillips, president; J. E. Cameron, treasurer and general manager; Paul O. Lawton, secretary and assistant treasurer; Robert Cowen, factory manager.

The Kent Company, Inc., Rome, N. Y., manufacturer of waxing and polishing machines, has announced the appointment of W. L. Schoonmaker as sales manager. He comes from the position of manager of export sales on motor driven household appliances for the International Electric Company.

W. C. Bryant has resigned as president of The Bryant Electric Company, Bridgeport, Conn., to assume the post of chairman of the board of directors. Walter Cary, first vice president of the Westinghouse Electric and Manufacturing Company, has been elected president in direct charge of the operation of the business. Mr. Bryant established the business in 1888 and has been executive head for thirty-nine years. He will retain an active interest in the affairs of the company.

Roach-Appleton Manufacturing Company, 3440 North Kimball Avenue, Chicago, announces the appointment of Royal Smith, 2807 Commerce Street, Dallas, Texas, as its sales agent for Texas and Oklahoma, exclusive of the Pan Handle district.

Crouse-Hinds Company, Syracuse, N. Y., has issued an 8-page bulletin known as G-4 called "Grounding for Safety." Bulletin G-3 on "Groundulets" has also been published.

Plainville Electrical Products Company, Plainville, Conn., has issued catalog No. 10 on panelboards, switchboards, fuse reducers and knife switches. It contains 44 pages and is illustrated throughout.

H. W. Kefgen is now representing the Weber wiring devices in Michigan, Ohio and Indiana, according to an announcement made by Henry D. Sears, general sales agent. Mr. Kefgen for the past ten years has been connected with the Detroit office of the Economy Fuse and Manufacturing Company and will continue to make his headquarters in Detroit.

American Electric Switch Corporation, Minerva, Ohio, reports that it has been reorganized with an authorized capital of \$1,000,000. The officers are: J. C. Lewis, president; Arthur Koch, secretary; E. F. Rinoehl, treasurer. The company will continue to manufacture a line of safety switches, panels, switchboards, panelboards and distribution panelboards.

Beardslee Chandelier Manufacturing Company, Chicago, announces the publication of a new catalog, No. 43, entitled "Distinctive Lighting Fixtures." This catalog contains new designs in fixtures and is to aid the dealer in selling the hard-to-please customer. The new book contains American colonial and early English designs, as well as some French and Italian fixtures.

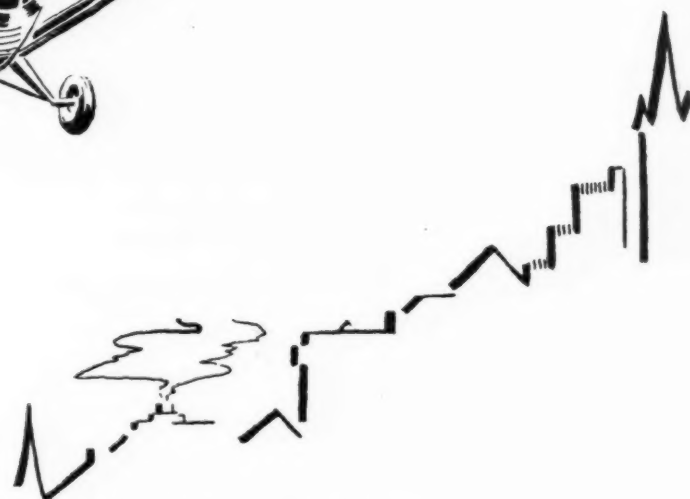
Sta-Warm Electric Heater Corporation has moved its general offices from Minneapolis, Minn., to 553 North Chestnut Street, Ravenna, Ohio. The company purchased a new and fully modern plant at Ravenna which makes possible greater production than heretofore.

A 16-page booklet on the Fynn-Weichsel motor has just been published by the Wagner Electric Corporation, St. Louis. Bulletins have also been prepared on the Wagner "66" and "76" motors. These folders are No. 149 and 150, respectively.

The Jacksonville (Fla.) representative of The Trumbull Electric Manufacturing Company, F. W. Knoepell, has changed his address from 2406 to 2822 St. Johns Avenue.

Knife Switch catalogue No. 41 has been issued by Frank Adam Electric Company, St. Louis, Mo.

advent



THE ELECTRICAL SPIRIT OF S^T. LOUIS

27th Annual
ELECTRAGIST CONVENTION
Aug. 9-12
1927

The Electrical Spirit of St. Louis

CERTAIN cities stand out in the electrical business, some because they are the home of the main factory of some large manufacturing company, some because there is located there some particularly large or interesting power plant, others for cooperation—but there is one that stands out for a number of things and may truly be called an electrical city—St. Louis.

From point of output of manufactured products there are other places that easily exceed it, but it is doubtful if there is any city in the United States that has the diversity of individual plants, each with a national reputation, as has St. Louis. Many cities have a large diversity of output for local consumption, but St. Louis—"The Gateway of the Southwest"—has developed a national distribution.

Its electrical power resources have always been well known, particularly since the Mississippi River was harnessed at Keokuk to help serve St. Louis.

As the early and natural trading point for the West, St. Louis of course developed as the jobbing center for a tremendous area.

Co-operation

The "get-together" spirit developed early in St. Louis.

Located in neither exactly the South nor the North, the East nor the West, St. Louis has caught the better characteristics of each. Perhaps that was one of the reasons why it was the home of the Jovian Order.

Atlantic City is known as a convention city because of its available accommodations. St. Louis is known as a convention city because of the completeness with which visitors are entertained and taken care of while there. One who has visited a convention at St. Louis never forgets it, and therein lies the Spirit of St. Louis—thoroughness. The hospitality of the South, the progressiveness of the North and West, the background of the East—all are in evidence.

The city which is acting as host to the 1927 convention of the Association

of Electragists, International, has made most of its progress as a manufacturing center since the war. The census figures which are shown unfortunately give the data for the City of St. Louis alone and do not include the figures of any of the production outside its corporate limits, but which is commonly thought of as St. Louis manufacture. There are several manufacturers beyond the line, notably the Wagner Electric Corporation, which would greatly increase the totals here shown.

Manufacturing

The growth of other manufactures of St. Louis has been apace with electrical. The central location of the city and its nearness to the source of supplies of raw materials has been a large factor. The transportation facilities offer the electrical manufacturer quick distribution of his products in all sections of the country. There are twenty-eight railroads coming into the city, and this together with the United States Government barge service on the Mississippi River to New Orleans and other river points enables the manufacturer to reach quickly all markets, domestic and foreign, on rail or river, at economical freight costs for almost straight line delivery.

Manufacturers in St. Louis, it is claimed, ship to two-thirds of the United States with a shorter freight haul and better service at lower freight costs via these railroads and the river than those of any other large industrial center.

Recently some of the largest industries in the country have awakened to

the possibilities of St. Louis as a production and distribution center, and are erecting immense plants there. In 1899 there were 11 electrical manufacturing plants in the city; the last census, 1925, showed 35. The General Electric Company recently purchased 155 acres in the city for a huge plant which, it has been reported, will employ 25,000 persons.

Jobbing Center

As a jobbing center, too, St. Louis is ideally located. The electrical supply jobbers selling out of the city cover approximately 100 miles in every direction from the city itself before they meet salesmen from other cities. Kansas City, Chicago, Little Rock, etc.

The spirit of cooperation among electrical men and interests has always occupied a high place in the industry's activities in St. Louis. St. Louisans maintain that they had the first incorporated electrical contracting organization—the St. Louis Electrical Exchange, incorporated in 1892. In 1901, when the national association was formed at Buffalo, the St. Louis Association had twenty-one members, all of whom became charter members of the national. Several of these members were present at the Buffalo meeting: Edward T. Cooke, Cooke Electric Company; Emil Haas, Beck Electric Company; Charles T. Sutter, F. E. Newbery, Newbery Electric Company; William Corrao, then of the Sellner Chandelier Company; A. Boeschstein, A. B. Electric Company, and S. A. Van Nort, Van Nort Bros. Electric Company. At that time William Wurdack, Sr., who later started

ELECTRICAL MACHINERY, APPARATUS, AND SUPPLIES

Census year	Number of establishments	Wage earners (average number)	Wages	Value of products
1925	35	3,996	\$4,877,842	\$20,347,850
1923	40	5,542	5,954,910	27,120,376
1921	34	3,520	3,370,929	15,852,935
1919	30	3,477	2,848,524	14,847,552
1914	12	1,420	827,542	3,275,247
1909	16	699	380,114	2,080,635
1904	16	784	407,458	1,712,833
1899	11	522	181,821	874,890
1889	35	399	265,411	674,950

Spirit of St. Louis

one of the leading electrical manufacturing companies in the city, was secretary of the association.

About this time the Missouri Association of Electrical Contractors was formed, with Charles J. Sutter, who furnished these interesting facts, as secretary, and in May, 1902, the name was changed to St. Louis Electrical Contractors Association.

Electrical Board of Trade

Another cooperative organization of the city that takes its place as one of the oldest of its kind in the country is the St. Louis Electrical Board of Trade. It was organized in 1909 as the St. Louis League of Electrical Interests.

The first meeting was held in the old Southern Hotel, among those present being W. A. Layman, former president and Walter Robbins, former vice-president, of the Wagner Electric Corporation; H. H. Humphrey, electrical engineer; Capt. Robert McCulloch, president of the United Railways Company, and Frederick A. Kehl, who is now president of the Brilliant Company. Capt. McCulloch was elected president. In 1919 its present name was adopted after a reorganization.

Approximately 800 of the leading electrical men of St. Louis are individual members and 45 companies operating in the city are underwriting members. Weekly luncheon-meetings for the membership are held from September until June and the organization takes an active part in all electrical affairs in the city.

The Electrical Board of Trade maintains a suite of offices in the Southwestern Bell Telephone Building in charge of Carl H. Christine, its secretary-manager.

The Central Station

The Union Electric Light & Power Company has contributed in no small way to the industrial development of St. Louis, and during 1926, 1,326,818,598 kilowatt-hours were consumed by the customers on the company's lines. In this period the manufacturers of electrical goods in the city purchased more power than the total alternating current sales of 1912.

The first unit of the generating system of the Union company was started twenty-five years ago when the foundations of the Ashley Power Plant were laid at the foot of Ashley Street. This plant had a generating capacity of

12,000 kilowatts and served 8000 customers. It is now a unit in what is today one of the greatest electric power developments in the West.

Industrial St. Louis began almost immediately to increase its demand for power and by 1909 the company had to increase its generating capacity more than 300 per cent and was serving 24,000 customers. The year 1913 brought a new development in the power situation in the Middle West when the great hydroelectric plant at Keokuk, Iowa, was built. Visualizing the tremendous demand yet to come, the central station company purchased under a long term contract 45,000 kilowatts

by an additional 50,000 kilowatt unit.

The output of the plants under control of the Union Electric Light & Power Company at the end of each five-year period indicates the growth.

1905	45,588 274 kw.-hr.
1910	139,674,344 "
1915	183,000,033 "
1920	471,158,047 "
1925	1,187,188,065 "
1926	1,326,818,598 "

The biggest portion of this output, 62 per cent, is consumed by the 250,000 customers in the St. Louis district, and probably the most impressive fact in the electrical growth of the district is the tremendous increase in the purchase of electricity for manufacturing purposes.

Manufacturing Plants

Delegates to the convention will have an opportunity afforded by few other convention places, namely, that of visiting the factories that turn out the products that contractors are daily buying and installing, and it is interesting to note that in St. Louis are two headed by men who were formerly contractors and quite active in association work: The Frank Adam Electric Company, of which Fred Adam, former executive committeeman of the national, is president; and the Wm. Wurdack Electric Manufacturing Company, formed by William Wurdack, secretary of the local contractors' association at the time the national was formed.

Frank Adam Electric Company

Frank Adam, the founder of the company bearing his name, which is devoted to the manufacture of panelboards and switchboards, was originally a manufacturer of optical and surveying instruments, and when annunciators, door bells and burglar alarms first came into use he took up that type of work. The work of installing these gave him experience in the wiring end of the business and he branched out as a contractor in 1886.

Fred B. Adam, son of Frank and present head of the company, is a foremost figure in the electrical industry in St. Louis and has taken an active part in making plans for the 1927 Electra-gist convention. He worked with his father in the early contracting days and saw the company grow into one of considerable size.

When the panelboard came to be looked upon as necessary in wiring, and the question of proper fusing, in-



Carl H. Christine

Secretary-Manager of the St. Louis Electrical Board of Trade and secretary of the general committee in charge of arrangements of the St. Louis Electragists' Convention

of the capacity of that plant and made it available to St. Louis industry.

As the city was increasing its demand for power at a remarkable pace, it was soon necessary to scrap the original generating equipment in the Ashley plant and to install high capacity units in its place. This raised the capacity of the plant from the original 12,000 kilowatts to 122,000. At the same time one of the largest steam plants in the country, Cahokia, was planned and in 1923 this went into operation. Two years ago, to further fortify the electrical situation in the district, the Union company bought the Keokuk plant and by 1926 the combined capacity of the plants owned or controlled by the company was in excess of 400,000 kilowatts, which at the present time is being augmented

The SIGN OF A BETTER JOB



This **FA** Achievement has Changed the Whole Panelboard Industry

The soundness of **FA** design, even when revolutionary to old ideas, is attested to by the eagerness of competitors in following it. Since **FA** Sectionally Constructed Panelboards appeared the whole industry has followed the **FA** leadership that had long been established by earlier improvements. Naturally **FA** Panelboards are still years ahead of others, because they have the benefit of experi-

enced engineering in constant effort to give greater service to Architects, Engineers, Owners, and Contractors.

FA Panelboards save money on the job, and cost no more to begin with. Certainly there is no reason for specifying other than **FA** and to put "or equal" is futile, as there is no equal.

Write for the **FA**
Panelboard Catalog



Frank Adam
ELECTRIC COMPANY
ST. LOUIS

DISTRICT OFFICES:

Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Brooklyn, N. Y.
Buffalo, N. Y.
Charlotte, N. C.

Chicago, Ill.
Cincinnati, O.
Dallas, Texas
Denver, Colo.
Detroit, Mich.
Kansas City, Mo.

Los Angeles, Calif.
Memphis, Tenn.
Miami, Fla.
Minneapolis, Minn.
New Orleans, La.
Omaha, Neb.

Philadelphia, Pa.
Pittsburgh, Pa.
San Francisco, Calif.
Seattle, Wash.
Vancouver, B. C.
Walkerville, Ont.
Winnipeg, Man.

sulation, etc., came into being, the manufacture of panelboards was started not only for its own jobs but also for other contracting organizations, and in 1898 the Frank Adam Electric Company was organized.

About this time the company bought out the switchboard business of the Emerson Electric Manufacturing Company, and this addition to the Adam company necessitated larger quarters. At the time of the World's Fair in St. Louis, in 1904, the demand on the company became so great that the manufacturing end became more important than did the contracting branch, and arrangements were made to include lighting fixtures as a part of the former.

The steady growth of the business was such that in 1918 the company purchased a site on Windsor Place, running through to Bell Avenue, on which it erected a building which now houses the operations and offices of the company. The structure is of saw-tooth design and all the manufacturing operations are carried on on one floor.

The Frank Adam Electric Company originated the idea of the moulded sectional safety type panelboard, the use of which put the manufacturing of panelboards on a mass production basis that was not possible with the old method where each panelboard had to be mounted on its own individual slate base.

With the increasing importance of the manufacturing end of the company's business it was finally decided that the best results could be obtained if the contracting business and all retailing activities were disposed of. The company was then able to devote its entire attention to the manufacturing end of its business, and later developed a successful system of stage lighting control.

Its experience in the contracting business has given the company an insight into contractor problems, and the contractor is taken into consideration in the design of all its products.

Wagner Electric Corporation

Another of the leading electrical manufacturers of St. Louis is the Wagner Electric Corporation, the largest electrical manufacturing company west of the Mississippi River and the third

largest company specializing in electrical machinery in the United States.

The Wagner company was founded in 1890 by Herbert A. Wagner, who is now president of the Consolidated Gas, Electric Light and Power Company, Baltimore, and Ferdinand Schwedtman, who is now a vice president of the National City Bank, New York City. These men, appreciating the opportunity for developing the alternating-current motors, began in a small shop in a very limited way the manufacture of desk fans. From a beginning in this man-

viously been exclusively with direct current, and alternating current came into use just a short time before the Wagner company started. Its pioneer work in building transformers for what were at the time high voltages did much to quickly establish the reputation of the young company in all sections of the country.

In the motor field the efforts of the Wagner company to produce a satisfactory single-phase motor were met with success and the motor business rapidly became an important adjunct to the company's activities. Polyphase motors, too, became a prominent part of the manufacturing activities when the basic patents expired in 1905. Further pioneering brought out the Fynn-Weischel motor in 1923. This was produced in an endeavor to solve the power-factor problem and is a radically new type of constant-speed alternating current motor.

In addition to the Fynn-Weischel motor, the Wagner Electric Corporation claims among its accomplishments the following: The first commercially successful single-phase motor, the first 10,000-volt oil-filled water-cooled transformer, the first 40,000-volt transformer, the first 1,500-k.va. transformer, the first commercially successful unity power factor single-phase motor, the first American transformer with silicon-steel core, the first motor using directed draft ventilation, the first perfected starterless induction motor, besides pioneering in automotive starting, lighting and ignition systems.

The present officers of the Wagner Electric Corporation are: President, P. B. Postlethwaite; vice president, A. H. Timmerman; vice president and treasurer, V. W. Bergenthal; assistant treasurer, A. K. Bahret; secretary, J. W. Westcott.

Century Electric Company

The Century Electric Company was incorporated in 1901 and at the present time occupies a group of buildings which cover more than ten acres of floor space. The company was started from a small investment and its growth was financed largely from the salaries and earnings of the founders being re-invested in the enterprise. Century's greatest claim for distinction in the electrical industry is the position it has



C. H. Chapline

Chairman of the General Committee in charge of the Twenty-seventh Annual Convention of the Association of Electragists, International. Mr. Chapline is a member of the Rick-Chapline Electric Company, one of the foremost electrical contracting organizations in St. Louis. It is interesting to note that one of the first big jobs his company had was the electrification of the Hotel Chase, where the convention is being held.

ner the Wagner company has grown until at the present time it is capitalized at \$7,500,000, employs 4,000 people and its plants occupy more than thirteen acres of ground.

For the first three years of the company's existence the products were alternating-current fan motors, direct-current motors and transformers. At the present time the transformer department is one of the leading departments of the company.

In the early stages the transformer business just about kept the young company going. The use of electricity for lighting and later for power had pre-

Welcome Electragists to St. Louis

Many Things
to Do and See

August
8 - 12

*A*SIDE FROM the convention itself, St. Louis offers you an unusual combination of pleasure and inspiration.

Inspect the great civic improvement plan now under way. See a park system and zoo with cageless bear pits unsurpassed by any in America. Don't overlook the outdoor theatres with mammoth stages—a lighting installation and loud speaker equipment that will interest you. See the beautiful homes for which St. Louis is famous. Play golf, swim, watch big league base ball.

And by all means include the electrical industry in your visit. Our factories are open to your inspection at 2018 Washington Avenue—the home of the Emerson fans with the 5-year guarantee, and Emerson motors 2 h.p. and smaller.



*Where EMERSON fans and
motors are made in St. Louis*

*Welcome to
St. Louis*

**The Emerson Electric
Mfg. Co.**

2018 Washington Ave., St. Louis, Mo.
806 W. Washington Blvd., Chicago
50 Church Street, New York City

BUILT TO LAST
EMERSON
MOTORS
and **FANS**

SPLIT-
PHASE
POLYPHASE
DIRECT CURRENT

RE-
PULSION
START
INDUCTION

Spirit of St. Louis

achieved in the modernization of single-phase motors. The company's growth at St. Louis has been paralleled by the growth of the organization outside the city. At the present time there are thirty-two stock points of the company in the United States and more than fifty agents who carry stocks of Century motors in foreign countries.

The products of the company consist now of repulsion start induction single-phase motors from 1/6 h.p. to 40 h.p., polyphase motors from 1/4 h.p. to 75 h.p., and a full line of portable and ceiling fans.

Active management of the company's affairs is in the hands of those who have been responsible for its growth and successful operation. All of the principal officers have been with the company for a number of years. President, E. S. Pillsbury; vice presidents, Senter M. Jones and R. J. Russell, in charge of purchases and sales, respectively, have been with the organization for more than twenty years and have been responsible for its policies and the conduct of its business since its inception.

The Bussmann Company

The Bussmann Company has come to be one of the most important electrical manufacturing organizations in St. Louis, although founded but fourteen years ago. It was organized in 1913 by the four Bussmann brothers with a total capital of a few hundred dollars. The organization is best known for its line of fuses and lights.

The original fuse line consisted of non-renewable fuses made to meet a local demand. Today the line includes fuses of all types and sizes which are sold throughout the United States, Can-

ada and many foreign countries. In 1922 a line of lights was added.

The Emerson Electric Manufacturing Company

The Emerson Electric Manufacturing Company is a St. Louis institution of 35 years standing and has four factories devoted to its products, fans and motors. Three of these buildings are located on Washington Avenue and the fourth is a block distant.

Organized in 1891, the Emerson company offered a line of switchboards and panelboards, switches and other electrical specialties, to which fans and small motors were later added. In the course of ten years the company's fan and motor business had reached such proportions that all other lines were discontinued and the Frank Adam Electric Company, as already stated, took over the switchboard business. The company has since concentrated on motors of two horsepower and less, fan motors and such motor applications as exhaust and ventilating equipment.

From its factories at St. Louis the Emerson company supplies the requirements of a large number of manufacturers of electrically operated devices for use in factory, store, office and home. In addition to the special motors required by such manufacturers, stocks of more than one hundred and fifty types of motors are carried at St. Louis, New York and Chicago. Stocks of fans are maintained at these points and also at Dallas and Houston, Texas, and are carried by more than one hundred distributors in all parts of the country.

Moloney Electric Company

The Moloney Electric Company, which is known for its transformers in

all parts of the world, had its beginning in St. Louis in 1896. At that time transformers were very small in size and gave an endless amount of trouble as a result of storms. From a very small beginning at that time the organization has grown steadily in size until at the present time it boasts of a plant covering more than 250,000 sq. ft. of floor space with a total ground area of thirteen acres and over 3,800 ft. of railroad siding tracks.

The Moloney company was among the first in this country to use silicon steel in transformer manufacture and the first to build a three-wire core type transformer.

J. T. Moloney is president and founder of the company and James J. Mullen is its vice president and general manager. Both of these men have guided the company since its early days and are still actively engaged in the conduct of the business.

The Edwin F. Guth Company

A chance meeting of four boys whose sole possessions were an idea, a very few dollars and "nerve" has developed in the past quarter-century into one of the successes of the lighting field and one of the outstanding organizations of St. Louis, The Edwin F. Guth Company.

It was in 1902 that the St. Louis Brass Manufacturing Company, as the Guth company was then called, was organized, starting operations in a little one-room store on Olive Street. In 1904 it secured its first real job, that of equipping one of the buildings at the St. Louis Fair. This job was so successful that a similar contract for another building, that of the Brazilian government, was secured. From that time on



Great Hydroelectric Dam at Keokuk, Iowa, One of the Sources of the City's Electric Power

their business started to pick up, and the next big jobs, equipping a large department store and Marquette Hotel, came to the young concern.

Steady increase in business necessitated a move to larger quarters from time to time, and today the Guth plant has 124,000 sq. ft. of factory floor space at the corner of Jefferson and Washington Avenues. Some years ago the company merged with the Brascolite Company and the present name was adopted.

W. N. Matthews Corporation

The W. N. Matthews Corporation was started in St. Louis in 1899 to manufacture anchors and other electrical specialties. The business has grown steadily until at the present time it occupies a large factory on Forest Park Boulevard and includes in its products a full line of disconnecting switches, anchors, lamp guards, reels, slack pullers and other products. Branch offices are maintained in all the principal cities



Charles J. Sutter

One of the charter members of the national and secretary of the old Missouri Association of Electrical Contractors.

of the United States, Canada and Great Britain.

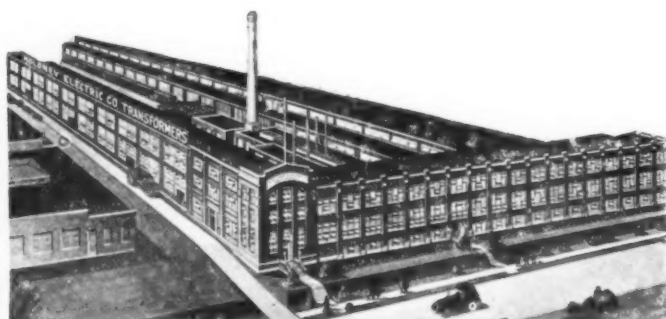
The present officers of the corporation are: President, W. N. Matthews; vice president and treasurer C.

L. Matthews; secretary, Carlton Cooley.

Standard Underground Cable Company

The Standard Underground Cable Company while not strictly a St. Louis organization, since it has its headquarters in another city, Pittsburgh, has a large plant in St. Louis devoted to the manufacture of bare and insulated wires, cables and cable accessories. Every process in the manufacture of electrical conductors is carried out in this plant, which contains over 180,000 sq. ft. of floor space. The copper ingots or wire bars are rolled into wire rods, the rods are drawn into wire of various sizes and then cabled, insulated, lead covered and armored into large and small cables for light, power, telephone and telegraph service. The St. Louis factory was completed in 1922 and is the only plant of its kind in St. Louis. It is located on North Kingshighway Boulevard.

The Standard Underground Cable



Some of the Electrical Manufacturers of St. Louis. Reading from left to right, upper row, The Edwin F. Guth Company, Emerson Electric Manufacturing Company, Standard Underground Cable Company, the Century Electric Company, Frank Adams Electric Company.

Spirit of St. Louis

Company dates from 1882 and was the pioneer company devoted to the manufacture of lead-covered underground cables in the United States. The St. Louis factory is one of four plants, the others being located at Perth Amboy, N. J., Pittsburgh and Emeryville, Cal.

The officers of the company are: President, J. W. Marsh; vice presidents, P. H. W. Smith, C. J. Marsh and A. B. Saurman; secretary, J. W. Shibley; treasurer, C. M. Hagen.

Other Companies

In addition to these companies, St. Louis contains many others whose names are known throughout the land as prominent in their respective branches. Wm. Wurdack Electric Manufacturing Company is located there, as are The Brilliant Company, a plant of the National Lamp Works of the General Electric Company; Valley Electric Company, a plant of the Westinghouse Electric and Manufacturing Company, de-

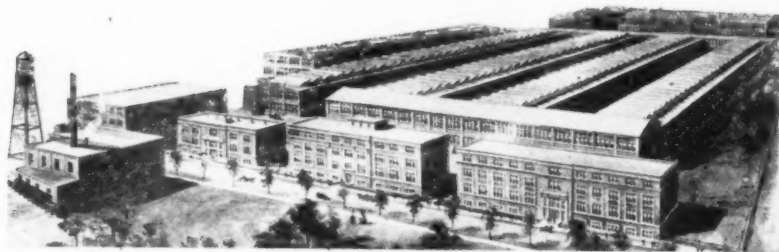
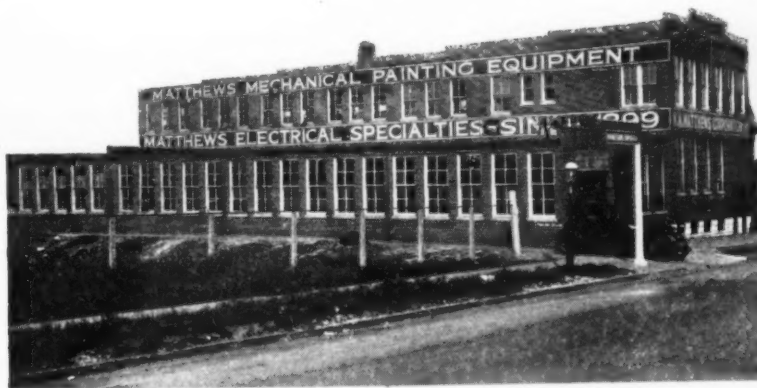


Fred B. Adam

President of the Frank Adam Electric Company. Mr. Adam is a former national committeeman of the National Association of Electrical Contractors and Dealers.

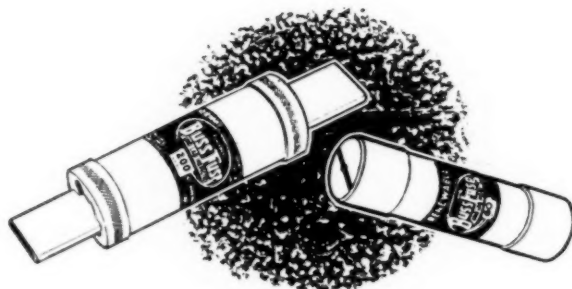
voted to manufacture of lamp posts; Baldor Electric Company, Chandeysson Electric Company, Galvin Electric Manufacturing Company, Gross Chandelier Company, James J. Kearny Corporation, Killark Electric Manufacturing Company, Charles S. Lewis & Co., Majestic Electric Manufacturing Company, Superior Insulating Tape Company, Watlow Electric Manufacturing Company and T. C. White Electrical Supply Company.

With such representative manufacturing organizations as those listed, whose products include almost every conceivable electrical device; with its vast power resources, with its splendidly developed ideas of cooperation within the industry, St. Louis stands in the forefront of electrical cities. The Electrical Spirit of St. Louis stands out like a beacon showing what can be accomplished and drawing other cities on to emulate the splendid example it has set for them to follow.



Manufacturing Plants in St. Louis

Standard Underground Cable Company, W. N. Matthews Corporation. Lower row, Moloney Electric Company, one of the buildings of Frank Adam Electric Company, Wagner Electric Company



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